

**NEWLY POSTMENARCHEAL ADOLESCENTS' UNDERSTANDING OF MENARCHE
AND MENSTRUATION ACROSS RACE AND INCOME LEVEL AS DEFINED BY
QUALIFICATION STATUS FOR FREE OR REDUCED LUNCHES**

by

Lisandra Rodriguez White

B.A. Psychology, Chatham College, 1999

M.A. Research Methodology, University of Pittsburgh, 2001

Submitted to the Graduate Faculty of
School of Education in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

University of Pittsburgh

UNIVERSITY OF PITTSBURGH

SCHOOL OF EDUCATION

This dissertation was presented

by

Lisandra Rodriguez White

It was defended on

September 17, 2008

and approved by

Carol E. Baker, Ph.D., Psychology in Education

Margaret L. Stubbs, Ph.D., Psychology

Joan I. Vondra, Ph.D., Psychology in Education

Dissertation Advisor: Jane E. Pizzolato, Ph.D., Psychology in Education

**NEWLY POSTMENARCHEAL ADOLESCENTS' UNDERSTANDING OF
MENARCHE AND MENSTRUATION ACROSS RACE AND INCOME LEVEL AS
DEFINED BY QUALIFICATION STATUS FOR FREE OR REDUCED LUNCHES**

Lisandra Rodriguez White, M.A.

University of Pittsburgh, 2008

This cross-sectional, quantitative and qualitative study examines the roles of race and income level in adolescent girls' knowledge about menstruation, feelings of preparation for menarche, and attitudes toward menstruation. Participants included 169 newly postmenarcheal adolescents between the ages of 11 and 15. Participants were categorized into four groups: Caucasians from higher income homes (N = 37), Caucasians from lower income homes (N = 46), African Americans from higher income homes (N = 33), and African Americans from lower income homes (N = 53). Race was determined via self-report. Income level was determined by a self-report qualification status for free or reduced lunches. The outcomes indicated that, overall, participants' lacked accurate menstrual knowledge and felt unprepared for menarche. However, the overall menstrual attitudes reported by participants were ambivalent, indicating that menstrual attitudes do not appear to be negatively affected by a lack of menstrual knowledge and preparation. Additionally, by themselves, race and income level do not seem to play a substantial role in adolescents' understanding of menarche and menstruation. They do, however, seem to interact, with the real differences lying between higher income Caucasians and each of the other three racial and income level groupings. As a group, the responses of higher income Caucasian participants stood apart from and indicated that they fared better than the other race and income level groupings. Furthermore, participants appeared to incorporate menstrual taboos into how they approached learning about menstruation and preparing for menarche, but not necessarily in their development of menstrual attitudes. Results from this study could be useful for health care providers and educators for improving ways in which information about menstruation is addressed and disseminated. The delivery method of information can be tailored so that it is better received by different racial and income groups. These results could also prove useful in the development of programs targeted to specific racial or income level groups to educate and empower adolescent girls about menstruation and their health.

TABLE OF CONTENTS

PREFACE	IX
ACKNOWLEDGEMENTS	XI
1.0 INTRODUCTION.....	1
2.0 LITERATURE REVIEW	4
2.1 A HISTORICAL AND CROSS CULTURAL VIEW OF MENSTRUATION	
4	
2.2 PRESENT DAY MENSTRUAL TABOOS AND PRACTICES	9
2.3 AGE AT MENSTRUAL ONSET	13
2.4 MENARCHE AND THE MENSTRUAL EDUCATION PROCESS	18
2.5 MENARCHE AND RACE	23
2.6 MENARCHE AND SOCIOECONOMIC STATUS.....	27
3.0 STATEMENT OF THE PROBLEM	30
3.1 RESEARCH QUESTIONS AND HYPOTHESES	31
4.0 METHODS.....	33
4.1 SAMPLE	33
4.2 STUDY DESIGN	34
4.3 PROCEDURES.....	34
4.4 MEASURES.....	35

4.4.1	Demographic questionnaire.....	36
4.4.2	Measure of menstrual knowledge.....	36
4.4.3	Measure of preparation for menarche	36
4.4.4	Adolescent menstrual attitudes questionnaire	37
4.5	DATA ANALYSIS	38
5.0	RESULTS.....	40
5.1	DESCRIPTIVE ANALYSES	40
5.1.1	Analysis for current age.....	41
5.1.2	Analysis for age at menarche.....	41
5.1.3	Analysis for length of time menstruating	43
5.2	ANALYSES FOR MEASURE OF MENSTRUAL KNOWLEDGE.....	44
5.2.1	Quantitative analysis of menstrual knowledge	44
5.2.2	Qualitative analysis of menstrual knowledge.....	47
5.3	ANALYSES FOR MEASURE OF PREPARATION FOR MENARCHE ...	49
5.3.1	Quantitative analysis of preparation for menarche.....	49
5.3.2	Qualitative analysis of preparation for menarche	52
5.4	ANALYSES FOR MEASURE OF MENSTRUAL ATTITUDES	55
6.0	DISCUSSION.....	57
6.1	RESULTS RELATED TO THE DEPENDENT MEASURES OF MENSTRUAL KNOWLEDGE, PREPARATION FOR MENARCHE, AND MENSTRUAL ATTITUDES.....	58
6.2	RESULTS RELATED TO HYPOTHESES.....	61
6.3	RESULTS RELATED TO THE QUALITATIVE DATA	63

6.4	LIMITATIONS OF THE CURRENT STUDY	68
6.5	SUGGESTIONS FOR FUTURE RESEARCH	69
6.6	SUMMARY AND CONCLUSIONS	71
APPENDIX A.....		74
APPENDIX B		78
APPENDIX C.....		83
REFERENCES.....		85

LIST OF TABLES

Table 1. Descriptive Statistics for Current Age by Race and Income Level.....	41
Table 2. Descriptive Statistics for Age at Menarche by Race and Income Level	42
Table 3. Descriptive Statistics for Number of Months Menstruating by Race and Income Level	43
Table 4. Menstrual Knowledge Mean Scores by Race and Income Level.....	44
Table 5. Two-Way ANOVA Summary Table for Menstrual Knowledge	45
Table 6. Categories of Qualitative Responses to Question of Why Girls Get Periods	48
Table 7. Preparation for Menarche Mean Scores by Race and Income Level	49
Table 8. Two-Way ANOVA Summary Table for Preparation for Menarche	50
Table 9. Types of Menstrual Information Sources	52
Table 10. Categories of Qualitative Responses of What Participants Wished They Knew Before Menarche	54
Table 11. Menstrual Attitudes Mean Scores by Race and Income Level	56
Table 12. Two-Way ANOVA Summary Table for Menstrual Attitudes.....	56

LIST OF FIGURES

Figure 1. Interaction of Race and Income Level on Menstrual Knowledge Scores	46
Figure 2. Interaction of Race and Income Level on Preparation for Menarche Scores	51

PREFACE

This cross-sectional, quantitative and qualitative study examines the roles of race and income level in adolescent girls' knowledge about menstruation, feelings of preparation for menarche, and attitudes toward menstruation. Participants included 169 newly postmenarcheal adolescents between the ages of 11 and 15. Participants were categorized into four groups: Caucasians from higher income homes (N = 37), Caucasians from lower income homes (N = 46), African Americans from higher income homes (N = 33), and African Americans from lower income homes (N = 53). Race was determined via self-report. Income level was determined by a self-report qualification status for free or reduced lunches.

The outcomes indicated that, overall, participants' lacked accurate menstrual knowledge and felt unprepared for menarche. However, the overall menstrual attitudes reported by participants were ambivalent, indicating that menstrual attitudes do not appear to be negatively affected by a lack of menstrual knowledge and preparation. Additionally, by themselves, race and income level do not seem to play a substantial role in adolescents' understanding of menarche and menstruation. They do, however, seem to interact, with the real differences lying between higher income Caucasians and each of the other three racial and income level groupings. As a group, the responses of higher income Caucasian participants stood apart from and indicated that they fared better than the other race and income level groupings. Furthermore, participants appeared to incorporate menstrual taboos into how they approached learning about

menstruation and preparing for menarche, but not necessarily in their development of menstrual attitudes.

Results from this study could be useful for health care providers and educators for improving ways in which information about menstruation is addressed and disseminated. The delivery method of information can be tailored so that it is better received by different racial and income groups. These results could also prove useful in the development of programs targeted to specific racial or income level groups to educate and empower adolescent girls about menstruation and their health.

ACKNOWLEDGEMENTS

I would first like to thank my advisor, Dr. Jane Pizzolato. She consistently allowed this thesis to be my own work, but always steered me in the right direction whenever it was needed. Many thanks also go to Dr. Carol Baker. The statistical expertise, guidance, and friendship she has offered during my time at the University of Pittsburgh have been priceless. I would also like to express my gratitude to Dr. Joan Vondra for her encouragement and her willingness to share her great insight into the adolescent mind. I cannot begin to list the many things I have learned from her over the years. I am also eternally grateful to Dr. Peggy Stubbs who is responsible for introducing me to the fascinating world of menstrual cycle research during my undergraduate years and whose support and invaluable knowledge since that time has helped nurture what I believe will be a lifelong passion for me.

I would also like to express my appreciation to the churches and schools involved in this study. Their willingness to open their doors to this type of research made this paper possible.

The task of completing this paper would not have been feasible without the constant love and encouragement from my family and friends. In particular, the burden of writing this thesis was substantially lessened by the steadfast support and humor of my husband, Matthew, who means more to me than I can ever express. I would also like to thank my unborn son for the added incentive he provided to complete this paper before he entered the world and who was not afraid to give his mommy a swift kick when she needed the extra motivation to continue to write.

“When [menstrual] information is incorrect or limited it affects women’s ability to understand their own reality.”

-Buchanan, Villagran, & Ragan (2001, p. 108)

1.0 INTRODUCTION

Adolescence is a stage of growth and development in which major cognitive, psychological, and physical changes take place. Although both pubertal boys and girls need to adjust to new role expectations associated with this period of maturation, the physical changes experienced are different for each sex. For girls, one of the most memorable and defining moments of adolescence is menarche, the first menstrual period. It is a meaningful, dramatic, and concrete event which marks puberty. Unlike pubic hair growth and breast development, which are prolonged pubertal changes, menarche is unique in that its onset is abrupt. As the most distinct event of female puberty, menarche is a sign of physical maturity and fertility. It represents a transition from childhood to biological sexual maturity and this transition can be full of anxiety for the early adolescent.

The onset of menstruation is often met with a variety of reactions. In several studies, feelings of anxiety have been associated with menarche. Mixed feelings, such as being “excited but scared” and “happy and embarrassed,” are common (Chrisler & Zittel, 1998; Koff, Rierdan, & Jacobson, 1981; Petersen, 1983; Woods, Dery, & Most, 1983). In a study of pre- and post-menarcheal girls, Stubbs, Rierdan, and Koff (1989) found that pre-menarcheal girls tended to describe feelings of excitement and positive anticipation about menstruation whereas newly post-menarcheal girls expressed negative feelings and reactions, being “grossed out,” and feeling sick.

Psychoanalysts Thompson and Deutsch were among the first to focus on menarche as a key milestone in girls' development. Thompson (1942) maintained that menarche is a traumatic event during which girls experience a loss of freedom, power, and spontaneity and that there is a cultural denial of menarche and menstruation which manifests itself as a decrease in girls' self-esteem. Deutsch (1944) believed that girls' psychological reactions to menarche have a common root of anxiety "in which the approaching adulthood and sexuality are experienced as a threatening danger" (p.156). Deutsch argued that such anxiety is, in part, the result of a menstrual taboo that exists in our culture. A look into the history of menstruation supports these theorists' notions of a menstrual taboo. In fact, the history of menstruation reveals that women's periods have, since primitive times, been considered taboo in many cultures. This taboo, which played an awe-inspiring role in earlier civilizations, has, in more modern times, become a highly negative event. For a young girl embarking on the journey of puberty, living in a culture that endorses a taboo of something that is so pivotal to what it means to be female may make the transition into womanhood that much more trying and confusing. Such difficulties may ultimately lead a young girl to a negative outlook about herself.

Given that, the purpose of this study was to investigate how younger adolescent girls experience menstruation in present American culture where there are documented menstrual taboos (Britton, 1996; Delaney, Lupton, & Toth, 1988; Houppert, 1999; Laws, 1990; Williams, 1983). In particular, girls' menstrual attitudes, feelings of preparation for menarche, and knowledge about menstruation will be examined. Because the majority of research in this vein has been conducted with middle-class Caucasians (Yeung, Tang, & Lee, 2005) and because race and socioeconomic status have been found to impact many areas of a person's development (Adler, Boyce, Chesney, Folkman, & Syme, 1993; Evans & Stoddart, 1990; Feinstein, 1993;

Keating & Hertzman, 1999), this study utilized participants from various racial background and income levels in order to explore the role those variables play in reactions to menarche and menstruation.

2.0 LITERATURE REVIEW

In order to begin to understand the experience of menstruation, several facets which shape that experience must be first examined. To begin with, menstruation and menarche will be discussed within a historical and cross cultural context. Because culture dictates the beliefs, values, and behaviors that a person holds (Delaney et al., 1988), exploring menstruation within this framework will lead to insight into how negative views of menstruation are established. Additionally, present day menstrual taboos and practices will be discussed in order to identify the potential impact that a negative outlook on menstruation has on girls who are on the cusp of menarche and those who have already begun to menstruate. Also to be discussed are four specific factors that research has identified as playing a significant role in girls' adjustment to puberty and, in particular, the adjustment to menses. These factors are (a) age at menstrual onset, (b) preparation for and education about menstruation, (c) race, and (d) socioeconomic status (i.e. family income, parental education level, and parental occupation).

2.1 A HISTORICAL AND CROSS CULTURAL VIEW OF MENSTRUATION

From the most primitive cultures, the magic from which human life was created was believed to be inherent in menstrual blood. This blood and the women who shed it were regarded with a duality that expressed both holiness and uncleanness. The Latin word for menstruation was

sacer, meaning both pure and impure (Walker, 1983). The Romans called a menstruating woman *sacra*, sacred and accursed (Delaney et al., 1988). Words used in other early cultures to describe menstruation and menstruating women carried such meanings as supernatural, mysterious, incomprehensible, spirit, deity, and holy (Walker, 1983).

The meanings of these words indicate the reverence and fear primitive man associated with menstrual blood and with the unknown forces that caused the blood to flow. It has been inferred that the fear of menstrual blood held by early cultures resulted in an evolution that led to the alienation and tabooed state of the menstrual woman. In fact, the word “taboo” is believed to originate from the Polynesian word *tupua*, which means menstruation (Delaney et al., 1988; Golub, 1992; Novak, 1916; Walker, 1983). Delaney and colleagues (1988) described this evolution as beginning with primitive man worshiping the womb as a goddess until the stability of the new farming societies made it possible for man to use more direct ways to isolate the menstruating woman, and in effect, protect himself from the dangers he believed to be in menstrual blood.

Most primitive cultures believe that menstrual blood has the power to destroy crops and can be dangerous to hunters and the hunt. Some cultures, such as the Mae Enga of New Guinea and the Maori of New Zealand, believe that contact with menstrual blood or a menstruating woman can kill a man’s blood, thus resulting in a slow and painful death for the man (Meggitt, 1964). Others, like the Tinne Indians of the Yukon Territory, believe that the fundamental essence of femaleness resides in menstrual blood and, therefore, contact with a menstruating woman would threaten a man’s virility (Webster, 1942). Thus, women were secluded from their tribes or villages and confined to huts for the duration of the menses.

For menarcheal girls, this period of seclusion represents a rite of passage from childhood to womanhood. Among the more extreme devotees of the practice were the Carrier Indians of British Columbia, who forced a menarcheal girl to live alone in the wilderness where she remained secluded from her tribe and had to fend for herself for several years (Benedict, 1944). Natives of New Ireland, a large island in Papua New Guinea, kept their girls at home for the same period of time, but in cages, where they would get fat and pale, in accordance with the tribe's standards of beauty (Frazer, 1951). The Kolosh Indians of Alaska locked away newly menstruating girls in tiny huts for one year, during which time they were allowed no fire, exercise, or company (Frazer, 1951). In all these cultures, once the period of seclusion was complete, the girl emerged a woman and was ready for marriage.

Many of these societies also attribute positive magical properties to menstrual blood. Menstrual blood was used to ward off evil spirits and cure a variety of ailments including epilepsy, warts, leprosy, worms, and various gastrointestinal ailments (Delaney et al., 1988). The Aztecs used the menstrual blood of virgins as a special offering to their gods, particularly when they felt they had invoked the gods' anger (Schuman, 2001). In medieval Europe, the first napkin or rag worn by a virgin was saved because it was believed that it could cure the plague (Lindahl, McNamara, & Lindow, 2002). However, most people's view of menstrual blood remained negative. In his encyclopedia *Natural History*, Pliny (1989), the ancient Roman author and naturalist, recorded these damaging beliefs of menstrual blood:

Contact with it [menstrual blood] turns new wine sour, crops touched by it become barren, grafts die, seed in gardens are dried up, the fruit of trees falls off, the edge of steel and the gleam of ivory are dulled, hives of bees die, even bronze and iron are at once seized by rust, and a horrible smell fills the air; to taste it drives dogs mad and infects their bites with an incurable poison...Even that very tiny creature the ant is said to be sensitive to it and throws away grains of corn that taste of it and does not touch them again (p. 549).

Despite the advancement of time, the separation and seclusion of women because of their menstrual cycles was still a prevalent theme. During the nineteenth century in Saigon, women were not permitted to work in the opium industry for fear that the opium would become bitter if it came into contact with a menstruating woman (Novak, 1916). As women tried to gain equality in education and male-dominated professions, women were reminded that they were captives of their biology. In the medical profession it was said that women could not be entrusted with saving a person's life when they were monthly cripples who suffered from "periodic infirmities" [menstruation] that resulted in temporary insanity (Walsh, 1977). Other scholars told tales of the gynecological horrors that were certain to inflict women who sought higher education because learning diverted blood from their reproductive organs to the brain, thus severely crippling the development of their reproductive organs and resulting in a serious threat to the human race (Walsh, 1977).

Even the "modern" twentieth century was unkind to the menstruating woman. In the 1960's two books, *Private and Personal* and *The Menstrual Cycle*, were at the forefront in the arena of "menstrual politics" (Delaney et al., 1988). Both books discussed the economic disaster menstruation could cause by citing unsupported statistics and an untested correlation between menstruation and absenteeism from work. In 1970, a physician named Edgar Berman announced that women could not be trusted to make decisions that could affect the affairs of the nation because their "raging hormonal imbalances" would threaten the safety of America (Paige, 1973, p. 44). Anthropologist Lionel Tiger (1970), who also ascertained that women were the unfortunate victims of their cyclic hormonal variation, expressed concern over the impact that this could have on a girl's education: "A whole career in the educational system can be unfairly jeopardized because of this phenomenon" (p. 85).

In connection with religious functions, menstruating women in many cultures are banned from shrines, religious ceremonies, and they are not allowed to handle or touch religious objects or personalities. For instance, in African traditional religion, among the rules to be observed by trainee priestesses is one which stipulates that she should voluntarily absent herself from the shrine for seven days each month during her menstrual period for fear that menstrual blood is dangerously harmful to sacred objects (Shuttle & Redgrove, 2005; Weideger, 1976). In Shinto worship, Japan's indigenous religion, the unclean menstruating woman must not even pray near the *miya* (a Shinto holy shrine), much less make offerings or touch the sacred and divine vessels (Smith, 1991). Another example lies in the ancient Mayan culture where women were excluded from all ceremonial worship for fear that their blood-related impurities would invoke the anger of the gods who would in turn punish the Mayans with disease and famine (Schuman, 2001; Smith, 1991).

In addition to exclusion from religious practices, many societies and religions require menstruating women to undergo certain cleansing and purification practices. One of the most popular examples of these purification practices is found in the Orthodox Jewish tradition where menstruating women take part in the mikvah, an ancient ritual bath. The menstruating Jewish woman is expected to abstain from sex during the time of bleeding and for the 7-day period subsequent to bleeding (Delaney, et al., 1988; De Troyer, Herbert, Johnson, & Korte, 2003; Pogrebin, 1991; Wasserfall, 1999; Weideger, 1976). She performs the ritual act of immersing herself in the water a week after her bleeding has ceased so that she may emerge cleansed. As the Rambam (a great Jewish philosopher and codifier of Jewish law) states, "A woman cannot emerge from the state of impurity...until she immerses in the waters of a kosher *mikvah* without having anything intervening between her flesh and the water" (Hilchot *Issurei Biah* 11:16). It is

only after this ritual that the Jewish woman is considered pure and cleansed enough to resume relations with her spouse until her next menstrual period.

Thus, throughout history and into modern times, women have been told that their biology, particularly menstruation, made them physically, emotionally, and mentally incapable of furthering their education, having a place in national affairs, and competing with men in the male-dominated professions. They have been taught that menstruation is, as Aristotle described it: an outward sign of inferiority and a naturally occurring deformity (Delaney et al., 1988). Women have learned that menstruation is dangerous and unclean, and that it carries a social stigma of shame.

2.2 PRESENT DAY MENSTRUAL TABOOS AND PRACTICES

In American culture, this stigma encompasses three specific menstrual taboos: concealment (Laws, 1990), activity (Britton, 1996; Houppert, 1999), and communication (Williams, 1983). Studies have shown that these taboos are internalized at a young age and influence menstrual behaviors and attitudes (Britton, 1996; Hewitt, 2000; Houppert, 1999; Kissling, 1996; Roberts, Goldenberg, Power, & Pyszczynski, 2002; Williams, 1983).

The first taboo, the concealment taboo, refers to the belief that menstruation is something that should be hidden and kept secret (Laws, 1990). No evidence should exist of menstruation; therefore, women must go to great lengths to guarantee that they will not show any signs of menstruation. This includes not only hiding the blood itself, but also any products she may use during menstruation. If her menstruation is not kept secret, a woman can expect others to view her more critically and harshly. This was the case in a study of attitudes toward menstruating

women. Roberts and colleagues (2002) developed an experiment in which several groups of people were asked to evaluate a woman on her competence and likeability. The female accomplice pretended to accidentally drop either a tampon or a hairclip in front of the groups that would be rating her. Results showed that when she dropped the tampon, the actor was essentially punished for revealing that she was menstruating. Her competency evaluation and likeability score were significantly lower when a tampon was exposed than when a hair clip was dropped. The researchers also noted that there was a tendency to avoid sitting next to the tampon dropper.

The second taboo, the taboo of activity is the oldest and most universal of all the menstrual taboos. This taboo essentially limits a menstruating woman's physical behavior. In the Tampax Corporation's (1981) nationwide survey, one-third of respondents believed that physical activity should be restricted during menstruation. The report also found that Americans believe that swimming and bathing during menstruation should be avoided. More recently Houppert (1999) found that the majority of early adolescents she interviewed at a summer camp believed that it was physically harmful to swim or bathe while bleeding and that they were more prone to catching diseases while menstruating. In attempts to avoid letting other people know they are menstruating, many women may avoid participating in activities such as sports and sexual intercourse (Britton, 1996). In addition, these women may avoid other activities such as concerts, camping, picnics, or any other activity that may limit their access to a bathroom for fear of leaking and letting out their secret. These beliefs are still very prevalent in our society and clearly affect the way many females behave during menses.

It is also considered taboo to discuss menstruation, particularly for girls to discuss it with members of the opposite sex (Kissling, 1996; Williams, 1983). Because of social pressure, the menstruating girl feels required to maintain the taboos placed upon communication about her

experience (Kissling, 1996). Nevertheless, girls have questions and concerns regarding their own menstruation, and find the need to discuss this topic with friends. The social prohibition upon discussion of menstruation with others often causes parents to avoid discussing menstruation with their daughters, leaving the girls feeling unprepared for menarche (Kissling, 1996). These girls, desiring this information, are forced to partake in deviant behavior by breaking the communication taboo and finding a forum in which to discuss their situation with others who have similar experience. Their behavior is a threat to the social order that dictates that menstruation is to be kept silent (Hewitt, 2000).

Kissling (1996) discovered that girls developed creative linguistic strategies to gain knowledge from and share experiences with other girls, while continuing to “maintain face.” Many girls used slang terms and euphemisms in an attempt to disguise the actual topic of their conversation. The belief among these girls is that by using these terms, adults and boys will not understand what they are discussing. Many of the girls in Kissling's study used terms like "on the rag" and "period" (p. 298-299). The use of these terms made the topic seem less embarrassing for the girls. One girl explained the use of these terms by saying, "I think it's what makes it so much easier to talk to your friends, and they know what you're talking about," (p. 299). However, it is noteworthy that the euphemisms chosen by the girls in the study were mostly derogatory rather than pleasant or neutral in nature suggesting that the girls in this study consider menstruation a negative event.

Another tactic girls used was the use of circumlocutions and omissions to avoid naming menstruation itself (Kissling, 1996). Unlike euphemisms, however, they did not replace the word menstruation, but rather omitted it altogether. One example of this was the omission of the object for the verb "start," referring both to starting menstruation altogether, and starting a cycle. These

girls often used this tactic by saying, "I haven't started yet," "Oh, I'm going to start next week," "I was on the bus and I started," and "my sister confided in me, when she started" (p. 299). This "objectless start" (p. 300) is significantly used to refer to menstruation among these girls. In comparing this linguistic strategy when referring to menstruation and to its use in non-menstrual contexts, Kissling discovered that among the 80 occurrences of the word "start" with reference to menstruation, the word "menstruation" was omitted over 75 percent of the time. When using the verb "start" in reference to non-menstrual topics, however, the object being referred was omitted only 11 percent of the time (Kissling, 1996). This difference highlights the intense discomfort the girls felt in talking about menstruation and emphasizes the continuing and powerful presence of the communication taboo.

Euphemistic deixis was another strategy these girls used. "Deixis," as Kissling explains, "is a linguistic term for the indexical or pointing function of certain words, especially demonstratives, such as *that* and *those*, and pronouns such as *she*, *it*, and *them*," (p. 300, emphasis in original). Traditionally this technique is used when the object that is being referred to has already been mentioned. In discussing menstruation, the girls in Kissling's study often did not mention the word menstruation as the referent before using the deixis. Linguist Penelope calls this usage "false deixis," (as cited in Kissling, 1996, p. 300). It is this false deixis that most of the girls in this study used, not only for menstruation, but also for menstrual blood and menstrual products (Kissling). Even the one girl who claimed to be free of embarrassment when buying menstrual products still seemed embarrassed to name the products, and continued to use false deixis to discuss them (Kissling). Taken together, these studies reveal the ways in which females embody menstrual taboos and the ways in which such taboos dictate their behavior. The attitudes toward menstruation that a girl develops come from her "personal experiences and her

cultural conditioning” and can affect how she “thinks about herself...and her body” (McGrory, 1990, p. 265). Given such a long cultural history of negative menstrual views and their associated taboos, it comes as no surprise that many adolescents develop a negative opinion of menstruation and are uneasy about the experience of menarche.

Beyond the negative cultural history of menstruation, research has identified several specific factors that appear to play a significant role in girls’ adjustment to puberty and, in particular, their adjustment to menses. These factors are (a) age at menstrual onset, (b) preparation for and education about menstruation, (c) race, and (d) socioeconomic status (i.e. family income, parental education level, and parental occupation).

2.3 AGE AT MENSTRUAL ONSET

Over the past century, the age at which girls are reaching menarche has been decreasing dramatically. While the average age of menarche a century ago was 16-17, in current times the average age is 9-10. Part of the reason for this change is a rising standard of living (i.e., a greater abundance of available food, access to quality health care, better nutrition, safer and healthier living environment, and higher educational standards) that has characterized the progress of industrialized societies over the last 150 years. Because a girl’s body requires a certain amount of fat before she can menstruate (Brooks-Gunn & Petersen, 1983), having plenty of food available can lead to a quicker accumulation of that fat and, therefore, an earlier menstrual onset. "Menarche's new timetable demonstrates the power of the socio-economic environment to shape something as 'fixed' as the human body," (Brumberg, 1997, p. 4). Even among immigrants to this country, daughters raised in the standard of living common in the U.S. tend to mature earlier than

their counterparts in their native lands where access to food is not as readily available (Winter, 1997).

Although the primary reason for earlier physical maturity appears to be the increased standard of living that has taken place in the U.S. over the past century and a half, there may be other social foundations for this dramatic change in the process of female adolescent development. Recent studies (Belsky, Steinberg, & Draper, 1991; Moffit, Caspi, Belsky & Silva, 1992) have concluded that both family conflict and father absence may be significant stressors that contribute to earlier onset of menarche.

Father absence appears to be a stronger contributor to earlier physical maturity than mother absence. Surbey (1990) found that girls who experienced the absence of a biological father before menarche matured four to five months earlier than girls who experienced the loss of a mother or who were raised with both parents. Steinberg (1988), on the other hand, found that adolescent girls living in a strained family setting, particularly a strained mother/daughter relationship, also tended to mature earlier than their counterparts living in a less strained environment. In an attempt to understand the association between father absence/family conflict and earlier maturity, Moffit and her colleagues (1992) proposed a theory of circular patterns across generations. As she describes it, a girl who matures earlier will be more likely to marry and have children at a young age, and also to divorce, or to enter into single parenthood. This pattern puts the child into an absent father situation and/or a family conflict situation, possibly leading to earlier maturity for her as well. In today's society, with both divorce rates and single parenthood rising, these situations of family conflict and father absenteeism can only become more complicated for adolescent girls. However, it should be noted that much of the literature,

which indicates that stress can actually inhibit menstruation (e.g., Robert-McComb, Norman, & Zumwalt, 2007), is in direct conflict with this theory.

Regardless of the reason for early maturity, the fact remains that earlier menstruation can be difficult for young adolescents. Brooks-Gunn, Petersen, and Eichorn (1985) have indicated that rather than the actual event of menarche being the catalyst for psychological and behavioral repercussions, it is the *timing* of menarche that plays the most significant role in girls' development. This view is the basis for both the off-time hypothesis and the early-timing hypothesis.

The off-time hypothesis asserts that events that occur either earlier or later than expected may trigger acute levels of distress (Simmons & Blythe, 1987). For example, results from studies of early- and late-maturers suggest that being different from other adolescents in regard to pubertal development is particularly stressful (Livson & Peskin, 1980). Thus both groups, early and late developers, experience being outside the norm during adolescence and, as a result, may have difficulty in adjusting because they may not have the same levels of social support as those who mature at the same time as their peers. Furthermore, being outside the pubertal norm can prompt negative social comparisons which, in turn, only serve to compound the difficulties of pubertal and adolescent adjustment.

In contrast, the early-timing hypothesis argues that early-maturing girls are at greater risk than any other off-time maturation group for difficulties in adapting to the physical, psychological, and emotional changes associated with puberty (Stattin & Magnusson, 1990). Support for the early-timing hypothesis has been found in several studies that have indicated that the younger a girl is at menarche, the more likely she is to have lower self-esteem, poor body image, depression, behavioral problems, and lower academic success and is more likely to begin

dating and engage in sexual behaviors at an early age (Abraham, Fraser, Gebski, Knight, Llewellyn-Jones, Mira, & McNeil, 1985; Brooks-Gunn & Ruble, 1982; Koff, Rierdan, & Sheingold, 1982; Koff, Rierdan, & Stubbs, 1990; Moffit et al., 1992; Ruble & Brooks-Gunn, 1982; Simmons, Blythe & McKinney, 1983; Steinberg, 1988; Stoltzman, 1986; Surbey, 1990, 1998). Further evidence for the early-timing hypothesis was found in a longitudinal study that compared the effects of pubertal transition on psychological distress (Ge, Conger, & Elder, 1996). Findings showed that early maturing girls suffered significantly elevated levels of distress compared to peers whose pubertal trajectories were considered on-time or late. In a study that complements these findings, Brooks-Gunn (1992) found that late maturation acted as a protective factor against depression in adolescent girls.

How people react to an early-maturing girl may also be an important factor in the way in which she adapts. Regardless of their chronological age, post-menarcheal girls are expected to behave more maturely and more responsibly than their pre-menarcheal counterparts (Danza, 1983). However, for a girl who begins puberty early, these new expectations do not necessarily coincide with her cognitive and emotional level of maturity. This could make a girl more susceptible to shame and other negative feelings, resulting in her need to perpetuate menstrual taboos by hiding her menstruation from others.

The earlier age of physical maturity has not been met with parallel changes in cognitive and emotional development. "[O]ur society makes no special effort to help girls deal with the lag between their biological and their intellectual development," (Brumberg, 1997, p. 5). Adolescent girls are particularly vulnerable as they are only beginning to be able to think abstractly (Pipher, 1994), and move beyond egocentric thinking (Brumberg, 1997). "Many young women today look mature at age twelve or thirteen, but they still think in ways that are essentially childlike,"

(Brumberg, 1997, p. 5). Given that this is the case, one would expect that society would feel morally obligated to meet the emotional needs of these girls. Its failure to do so merely exacerbates the conflict experienced by the girls, whose physical and emotional/cognitive maturity levels are not coordinated with one another. Consequently, it is plausible to assume that many young girls are confused and emotionally unprepared for this event. Because of this, the risk of developing depression, low self-esteem, eating disorders, and a number of other negative behavioral and attitudinal problems among adolescent girls is increased.

In light of the fact that the age of puberty in America has dropped in recent decades (Chumlea, Schubert, Roche, Kulin, Lee, Himes, & Sun, 2003; Herman-Giddens, Slora, Wasserman, Bourdony, Bhapkar, Koch, & Hasemeier, 1997), it is reasonable to expect that today's early adolescents are at greater risk for maladjustment. How a girl adjusts to her sexual development early on will impact her future adjustment and well-being, particularly her adult sexual development and behavior. If young girls maintain distorted views about bodily functions and changes, their understanding, acceptance, and evaluation of these developmental milestones and their actual selves will be impeded. This was demonstrated in a survey of 114 women involved in romantic relationships in which respondents answered questionnaires on menstrual attitudes, comfort with personal sexuality, and sexual arousal (Rempel & Baumgartner, 2003). Results showed a strong positive correlation between menstrual attitudes and personal sexuality (i.e., women with more positive menstrual attitudes reported being more comfortable with their sexuality while women with negative views about menstruation were more likely to be uncomfortable with sex and their sexuality).

Whether overt or implied, messages laced with negativity can only be unhelpful at best and have potential to harm a young girl's perception of menstruation and, ultimately, of herself.

This damaging construction of menstruation "contributes to the way in which adolescent girls make the body into an intense project requiring careful scrutiny and constant personal control," (Brumberg, 1997, p. 30). Such views also help maintain menstrual taboos and perpetuate the development of negative menstrual attitudes. Early adolescent females who hold negative menstrual attitudes may find the experience of menarche more difficult than girls with positive menstrual attitudes.

2.4 MENARCHE AND THE MENSTRUAL EDUCATION PROCESS

Psychologists have theorized that negative recollections of the first menstrual experience have an important effect on subsequent attitudes toward menstruation and symptom experience (Brooks-Gunn & Ruble, 1982; Deutsch, 1944; Houppert, 1999). In particular, Deutsch (1944) cautioned that "in the course of a woman's lifetime the subjective events connected with the first menstruation have a tendency to recur at every other menstruation, but normally in a very weakened form" (p.182). One of the most prominent of these "subjective events" is the menstrual education process.

Over the last half century, menstrual education has been explored by numerous researchers who have focused on the sources of information and the underlying messages of the information communicated. Many have reported that menstruation information comes from multiple sources including mothers, siblings, peers, teachers, and various forms of media (Chrisler & Zittel, 1998; Deutsch, 1944; Koff & Rierdan, 1995; Rierdan, Koff, & Flaherty, 1983; Stolzman, 1986; Weideger, 1976). However, most researchers agree that the primary source of information is the mother. In her book, Brumberg talks about the existence of an

almost universal need to "reach for mother" at the onset of menarche (1997, p. 11). This is evidenced by accounts of women from all walks of life who have spoken and written about their first experience with menstruation and their need to connect to and find comfort in their mothers (Brumberg, 1997). Even in cases in which the mother-daughter relationship is strained, girls still turn to their mothers for comfort, guidance, and information when they reach menarche (Whisnant & Zegans, 1975).

The function of the mother in menstrual education is particularly important because girls may learn sex-role identity and related behaviors primarily through interaction and observation in the mother-daughter relationship (Menke, 1983). Because the mother-daughter dyad involves a reciprocal relationship in which each influences each other's beliefs and both are affected by their individual experiences, a belief held by the daughter that her mother had negative reactions to menstruation may cause the daughter to anticipate or experience these same negative reactions. In addition, a negative attitude towards menstruation from the mother may make it more difficult for the daughter to identify with her mother, thus creating conflict in the relationship. On the other hand, in families in which the mother holds a positive and open attitude towards menstruation, the daughter seems better able to identify with her mother as a positive model for mature womanhood (Danza, 1983).

Not surprisingly, several authors (Gillooly, 1998, Rierdan et al., 1983) have argued that because of the vital role the mother plays in preparing her daughter for menstruation, mothers should be emotionally supportive and knowledgeable about menstruation. However, many mothers, themselves, are unprepared for this task (Brumberg, 1997; Costos, Ackerman, & Paradis, 2002; Houppert, 1999; Janes & Morse, 1990). In fact, some mothers report that they are so uncomfortable and unnerved about discussing menstruation with their daughters that they

become secretive and uncommunicative on the subject (McKeever, 1984). When they are communicative, the messages provided by mothers are often laced with negativity. In order to identify the types of ideas and attitudes that mothers conveyed to their daughters about menstruation, Costos and colleagues (2002) conducted interviews with 138 women between the ages of 26 and 60. Their analysis revealed that the majority of the mother-daughter menstrual conversations were negative in tone. The negative messages presented by mothers were conveyed in various ways, including being unwilling to talk about menstruation, only giving instructions on the use of menstrual products, using negative labels, such as “the curse,” to refer to menstruation, and urging discretion and secrecy where menstruation is concerned.

In another study, Marvan, Morales, and Cortes-Iniestra (2006) interviewed 200 Mexican females of varying generations regarding their preparation for menarche. Specifically, participants were given a checklist of possible menstruation-related topics and asked to indicate whether or not those subject areas were discussed before or around the time of their first period. Content analyses revealed that in each generational group, the most common theme discussed was menstrual hygiene, while information about how women feel during menstruation was the least selected topic. Thus, like the Costos et al. (2002) study of Americans, the messages presented to Mexican women focused more on operational functions related to menstruation and less on the emotional and psychological needs of the newly menstruating girl. These studies suggest that, when it comes to menstrual education, mothers obey the menstrual taboos by limiting communication and urging secrecy among their daughters. Girls’ true needs at menarche are simply not being met and mothers are either unprepared or unwilling to meet those needs.

Other authors argue that in addition to displaying negative attitudes, the explanations mothers offer to girls may be misleading, and may in fact be partly or entirely inadequate to

represent the realities of menstruation, such as the emotional and psychological changes that may arrive with it (Koff & Rierdan, 1995). Results from a preparation for and expectation of menarche survey of 224 sixth grade girls revealed that girls have many preferences as to how they would like to be prepared for menarche (Koff & Rierdan).

The girls in the Koff and Rierdan (1995) study had conflicting feelings about menstruation and the way it should be handled. They were uncomfortable discussing menstruation, particularly with men; however, they expressed a desire for more openness and understanding. Most girls felt that menstruation should not be discussed with fathers, but at the same time they wanted their fathers to know that they had gotten their first period. Their expectations of their mother were great. Daughters expected their mothers to teach them about menstruation, be emotionally supportive, safeguard them from embarrassment and discomfort, and respect and protect their privacy.

Girls have also come to depend on the sanitary products industry for instruction on menstruation. Nevertheless, a number of researchers (Brumberg, 1997; Erchull, Chrisler, Gorman, & Johnston-Robledo, 2002; Havens & Svenson, 1988; Houppert, 1999; Whisnant, Brett, & Zegans, 1975) have concluded that the quality of the educational materials provided by sanitary product manufacturers is lacking.

Based on their interviews with nine- to 18-year-old girls, Whisnant et al., (1975) found that educational pamphlets developed by the sanitary products manufacturers played a major role in how girls learned about menstruation. As a result, the authors examined a large sample of these pamphlets. The authors identified several general problems in the educational materials. First, menstruation was framed in a medical model only. The experience of menstruation, that is, the emotional and psychological aspects, was disregarded. Additionally, the pamphlets and

brochures did not present the information within an appropriate developmental framework and often described menstruation in abstract and highly scientific terms that are difficult for younger girls to understand. Furthermore, menstruation was presented as a “hygiene crisis,” meaning that menstrual blood and the person shedding it are portrayed as dirty and in need of immediate sanitation. Such representations serve only to perpetuate menstrual shame and taboos. In fact, just by referring to menstrual products as “sanitary” products only reinforces the idea that menstruating women are unsanitary.

Havens and Svenson (1988) also found strong evidence of menstruation as a “hygiene crisis” in 31 audiovisual materials produced by sanitary product manufactures. Their analysis revealed that these films highlighted potentially embarrassing situations that could be assuaged by proper use of their products. Examples of these situations included leaking resulting in the staining of one’s clothes with blood, members of the opposite sex finding out that a girl was having her period, and emitting body odor.

A comparative analysis of earlier menstruation education booklets to more recent ones revealed that, regardless of the year in which the materials were published, the main focus was still menstrual management and hygiene (Erchull et al., 2002). It is of note, however, that the more contemporary booklets were less likely to approach discussion of menstruation from a “hygiene crisis” framework. This displays some progress in diminishing the view of menstruation as a pollutant. However, all 28 educational materials analyzed placed an emphasis on secrecy, thus indicating that even in the present day, girls are expected and taught to hide their menstruation.

Brumberg (1997) and Houppert (1999) made similar observations about the negativity of the menstrual educational process. In fact, in her examination of menstrual education films,

pamphlets, booklets, and ads, Houppert concluded that negative messages about menstruation dominated each medium. Houppert argued that part of the marketing strategy of the sanitary products industry is to capitalize on the menstrual taboo by making concealment and secrecy a primary selling point for their products. An example of this is found in an ad Tambrands (producers of Tampax tampons) ran in teen magazines during the 1990s:

You may do a lot of things to get noticed. Wearing a pad shouldn't be one of them. If you're wearing a pad you just may be announcing to everyone that you have your period. No matter how thin or „discreet' they say they've made pads, can they stand up to a pair of leggings? Tampax tampons can because they are worn on the inside where they can protect you sooner and no one can tell you're using them (Houppert, 1999, p.74).

Ads such as this sow anxiety in the young minds of pre- and early adolescents. They caution girls against the constant threat of embarrassment that can come from menstruating, particularly if great care is not taken to cover it up. Girls are scared into action and the sanitary product industry profits from their fear.

2.5 MENARCHE AND RACE

Culture and ethnicity are known to have strong influences on the events experienced throughout one's life. Menarche is no exception. Although there has been a great deal of research on girls' attitudes and behaviors toward, preparation for, and understanding of menarche and menstruation over the past thirty years, the vast majority of that research occurred in the United States. More recently, however, an exploration of these factors has begun in countries across the world.

In China, where even general information about menstruation was not publicly available before 1990, psychologists from the University of Hong Kong examined, for the first time in the history of the country, the emotional and psychological effects that menarche had on 1,573 early

adolescent, post-menarcheal girls (Tang, Yeung, & Lee, 2003). Participants completed four close-ended questionnaires that assessed menstrual attitudes, level of preparation for menarche, emotional reactions to menarche, and body image. Participant responses showed that menstrual attitudes were mostly negative, with over three-fourths of the sample reporting feelings of annoyance, confusion, embarrassment, and fear. In addition it was reported that only four percent of the girls felt they were well-prepared for menarche. Furthermore, regarding knowledge about menstruation, more than 77% of respondents felt their menstrual knowledge was inadequate and less than one percent felt the information they had was completely sufficient. While these findings echo results from studies conducted in the United States, there was one significant difference. Age at menstrual onset did not affect the self-esteem, body image, and menstrual attitudes of the girls in the Chinese study. The authors suggested that this may be due to the low level of variability in the age of onset of their participants. The ages of menstrual onset for the Chinese girls were all within less than a year of each other. Another reason could be that Western societies like the United States are more sexualized and have a more unattainable ideal of beauty than Eastern cultures.

Researchers in Mexico have also started to pay attention to the role menarche plays in emotional and psychological development. As previously discussed, Marvan and colleagues (2006), examined women across generations and found that the more women knew about menstruation before they begun to menstruate, the more positive feelings and memories they had about their menarcheal experience. The study also found that girls in the younger age cohorts were more likely to report ambivalence about menstruation, possibly due to the mixed messages they constantly receive in the media, in menstrual education literature, at home, and from their peers. Marvan and colleagues also found that the highest reported feeling at menarche was fear.

This differs slightly from American studies where fear is reported, but feelings of shame rank higher (Chrisler & Zittel, 1998; Houppert, 1999; Koff et al. 1981; Lee & Sasser-Coen, 1996; McGrory, 1990; Petersen, 1983; Stubbs et al., 1989; Woods et al., 1983).

Similarly, a study that compared the menstrual attitudes and experiences of 67 Indian college students to 61 American students concluded that Indian women tended to describe the experience of menarche as horrifying (Skandhan, Pandya, Skandhan, & Mehta, 1988). Reasons for the difference between the two cultural groups may result from the fact that the Americans in the study had more knowledge about menstruation and better preparation for menarche than did the Indian women.

Marvan, Vacio, and Espinosa-Hernandez (2001) compared the expected changes of 95 pre-menarcheal Mexican girls to the actual changes experienced by 98 of their post-menarcheal counterparts. Their answers revealed that both groups of girls had high negative expectations and experiences. Nevertheless, girls who had already experienced menarche also reported multiple positive experiences. The pre-menarcheal cohort, however, could not state more than one expected change that was positive. These findings both echo and contradict results from studies carried out in the United States (Brooks-Gunn & Ruble, 1982; Janes & Morse, 1990; Koff & Rierdan, 1996). As in Skandhan and colleagues' (1988) study, reasons for these differences may be due to the amount and quality of menstrual preparation individual girls in each study received.

Taken together, these cross-cultural studies show that while some feelings about menstruation are similar across cultures, the experience of menstruation is, nevertheless, influenced by cultural factors (Lee, 2001). As a result, findings based on American studies may not be an accurate representation of the menstrual experience of women from other cultures. The influence of culture also has implications for the generalizability of American studies conducted

with mostly Caucasian participants to non-white Americans. Exploring only the Caucasian response to menarche and menstruation ignores the experiences of all other American girls and women.

Although the amount of research on psychological and emotional effects of menstruation in non-American cultures has risen, the same cannot be said for this type of research among the various racial minority groups in America. As has been previously discussed, there is a negative correlation between age at menstrual onset and maladjustment. That is, the younger a girl is when she begins to menstruate, the more likely she is to participate in sexual behaviors at an early age, suffer from depression, have a poor body image, perform badly in school, and display behavior problems (Abraham et al., 1985; Brooks-Gunn & Ruble, 1982; Koff et al., 1982, 1990; Moffit et al., 1992; Ruble & Brooks-Gunn, 1982; Simmons et al., 1983; Steinberg, 1988; Stoltzman, 1986; Surbey, 1990, 1998). It is also known that African Americans reach puberty at an earlier age than any other racial group in the United States with Hispanics coming in second, followed by Caucasian, and then Asian Americans (Chumlea et al., 2002; Herman-Giddens et al., 1997; Malina, Bouchard, & Beunen, 1988). Given this, it can be hypothesized that African American girls are at greater risk for maladjustment than any other racial group in the United States. Despite this, most American research in this discipline has failed to explore the emotional and psychological impact of menarche among different racial groups within its own country, with the vast majority of research participants being Caucasian.

2.6 MENARCHE AND SOCIOECONOMIC STATUS

Socioeconomic status is yet another factor that has a far reaching impact on adolescent development and general well-being (Adler et al., 1993; Evans & Stoddart, 1990; Feinstein, 1993; Keating & Hertzman, 1999). Socioeconomic status may be the single most decisive factor in determining the settings in which a person spends her life (Evans & Stoddart, 1990; National Research Council, 1995). The type of neighborhood and home in which an individual lives, the quality of the school she attends, the social opportunities available to her, and access to and quality of health care services are chiefly controlled by an individual's socioeconomic status (National Research Council, 1995). Also strongly linked to socioeconomic status are an individual's prospects for advanced education and training and entry into the workforce (Bradley & Corwyn, 2002). Because of this, the effects of growing up in a climate marked by poverty can be devastating.

In a longitudinal study that looked at the effects of family economics on youth, Farran and Margolis (1987) found that living in a neighborhood comprised of lower socioeconomic families was negatively linked to children's positive behaviors and academic achievement. Youth from higher poverty neighborhoods were much more likely than their wealthier counterparts to have high rates of delinquent behavior and to do poorly in school. More recently, Ludwig, Ladd, and Duncan (2001) reported similar findings in a study that compared educational outcomes of children who began in poorer neighborhoods and subsequently moved to better neighborhoods to children who remained in very poor neighborhoods. They found that youth who moved to better neighborhoods had improved math and reading scores. They also found, however, that youth who moved from high poverty to low poverty areas initially experienced more grade retentions and disciplinary action, probably due to the fact that the new schools had

higher standards of achievement and behavior. In an almost identical study, Ludwig, Duncan, and Hirschfield (2001) assessed the impact of moving from high poverty neighborhoods to low poverty neighborhoods on juvenile crime. Findings indicated that adolescents who moved to better neighborhoods were significantly less likely to be arrested for violent crimes than teenagers who continued to live in high poverty communities.

Given what is known about how environmental stressors influence pubertal timing, the environmental stressors associated with low socioeconomic status may also influence pubertal timing (Graber, Brooks-Gunn, & Warren, 1995; Moffit et al., 1992; Surbey, 1990). Presumably youth living in poverty are exposed to stressful conditions more often than youth from higher economic strata (Gillock & Reyes, 1999; Jargowsky & Bane, 1990; Jencks & Mayer, 1990; Kim & Smith, 1998; Silbereisen, Walper, & Albrecht, 1990) and it is this chronic exposure to stress that may trigger early puberty (Graber, Brooks-Gunn, & Warren, 1995; Moffit et al., 1992; Surbey, 1990). Examples of such stressors include family conflict, father absenteeism, substandard living conditions, and violence in the home, at school or in the neighborhood, all of which have been shown to be disproportionately experienced by low-income individuals (Geronimus, 1996; Steinberg, 1988; Surbey, 1990).

Additionally, adolescents who grow up in poverty may not receive proper supervision because parents are under a great deal of stress and/or working many hours without being able to afford professional care for their children. As a result, low-income adolescents typically gain autonomy at earlier ages than their wealthier counterparts (National Research Council, 1995), which can lead to engagement in risky and dangerous behaviors at a younger age (Blum et al., 2000; Richardson, Radziszewska, Dent, & Flay, 1993). Among these behaviors is early sexual activity, which can result in teen pregnancy and, thus, perpetuate the cycle of poverty. Therefore,

it is important to determine what early adolescents from low socioeconomic backgrounds understand about menstruation and the effects that menarche has on their emotional and psychological well-being and their engagement in sexual behaviors.

Despite the extensive research on socioeconomic status and its effects on development and general well-being, little research exists on the impact of social class on adjustment to menarche. One study of Mexican adolescents found that the upper class girls had mothers who communicated more accepting messages about menstruation than did mothers from lower class families (Benjet & Hernandez-Guzman, 2002). Given that, it's not surprising that girls in the study from upper class families had more positive menstrual attitudes and less anxiety about menstruation than girls from lower class families. Combining these findings with the knowledge that poverty affects many aspects of adolescent development, it is not unreasonable to expect a link between socioeconomic status and a girl's emotional and psychological reactions to her first period. Like culture and ethnicity, the role socioeconomic status may play in girls' adjustment to menarche and menstruation has not been adequately explored, with most studies using participants from middle-class backgrounds only.

Based on the assertion that early developers experience greater anxiety and have more difficulty adjusting to puberty (particularly in a society laced with menstrual taboos), the current study was designed to investigate how newly postmenarcheal adolescent girls experience menstruation in present American culture. Because race and socioeconomic status alter a person's development, this study also explored differences related to each of these variables in reactions to menarche.

3.0 STATEMENT OF THE PROBLEM

The purpose of this study was to investigate the menstrual attitudes, feelings of preparation for menarche, and knowledge about menstruation of early adolescent girls from different ethnic and socioeconomic backgrounds to determine if race and socioeconomic status are associated with reactions to menarche and menstruation. To date, very little research considers the roles race and socioeconomic status play on early adolescent American girls' attitudes and behaviors toward, preparation for, and understanding of menarche and menstruation. Past research in this area has almost exclusively used Caucasian participants from a middle-class background (Yeung et al., 2005) and has failed to take into account the impact that both race and socioeconomic status have on development (Adler et al., 1993; Evans & Stoddart, 1990; Feinstein, 1993; Keating & Hertzman, 1999).

It is well known that girls from some racial groups, on average, experience menarche earlier than girls of other races (Chumlea et al., 2002; Herman-Giddens et al., 1997; Malina et al., 1988). It has also been documented that girls who start menarche at early ages tend to experience more challenges in adjusting to puberty than girls who start menstruating later (Abraham et al., 1985; Brooks-Gunn & Ruble, 1982; Koff et al., 1982, 1990; Moffit et al., 1992; Ruble & Brooks-Gunn, 1982; Simmons et al., 1983; Steinberg, 1988; Stoltzman, 1986; Surbey, 1990, 1998). In addition, poverty is known to have harmful effects on development (e.g., poor health and impaired cognitive development, academic development, and socio-emotional

functioning), whereas growing up in a more privileged environment tends to serve as a protective factor (Adler et al., 1993; Evans & Stoddart, 1990; Feinstein, 1993; Keating & Hertzman, 1999). As a result, girls from lower income homes may find menarche more confusing and difficult than girls from upper income homes. Therefore, it may not be appropriate to generalize findings that are based on either Caucasian-only samples or middle-class-only samples. Instead the menstrual experience of girls from various racial groups and socioeconomic backgrounds needed to be studied in order to accurately reflect the developmental journey of all types of American early adolescents.

3.1 RESEARCH QUESTIONS AND HYPOTHESES

Three research questions were investigated. These questions and their hypotheses are presented below.

RQ1—Are there differences in the knowledge about menstruation, feelings of preparation for menarche, and menstrual attitudes of early adolescents from different racial groups? Due to the fact that there is a negative correlation between age at menstrual onset and maladjustment (Abraham et al., 1985; Brooks-Gunn & Ruble, 1982; Koff et al., 1982, 1990; Moffit et al., 1992; Ruble & Brooks-Gunn, 1982; Simmons et al., 1983; Steinberg, 1988; Stoltzman, 1986; Surbey, 1990, 1998) coupled with the fact that African Americans reach puberty at an earlier age than any other racial group in the United States (Chumlea et al., 2002; Herman-Giddens et al., 1997; Malina et al., 1988), it was hypothesized that African American participants would (a) score lower on a menstrual knowledge test, (b) report feeling less prepared for menarche, and (c) report more negative menstrual attitudes than Caucasian participants.

RQ2—Are there differences in the knowledge about menstruation, feelings of preparation for menarche, and menstrual attitudes of early adolescents from different income levels?

Because poverty has been determined to have an adverse affect on development (Adler et al., 1993; Evans & Stoddart, 1990; Feinstein, 1993; Keating & Hertzman, 1999), it was hypothesized that participants from lower income households would (a) score lower on a menstrual knowledge test, (b) report feeling less prepared for menarche, and (c) report more negative menstrual attitudes than participants from higher income households.

RQ3—Is there an interaction between race and income level in the knowledge about menstruation, feelings of preparation for menarche, and menstrual attitudes of early adolescent girls? Due to the fact that (a) there is a negative correlation between age at menstrual onset and maladjustment (Abraham et al., 1985; Brooks-Gunn & Ruble, 1982; Koff et al., 1982, 1990; Moffit et al., 1992; Ruble & Brooks-Gunn, 1982; Simmons et al., 1983; Steinberg, 1988; Stoltzman, 1986; Surbey, 1990, 1998), (b) African Americans reach puberty at an earlier age than any other racial group in the United States (Chumlea et al., 2002; Herman-Giddens et al., 1997; Malina et al., 1988), and (c) poverty has been determined to have an adverse affect on development (Adler et al., 1993; Evans & Stoddart, 1990; Feinstein, 1993; Keating & Hertzman, 1999), it was hypothesized that African American participants from lower income households would (a) score lower on a menstrual knowledge test, (b) report feeling less prepared for menarche, and (c) report disproportionately more negative menstrual attitudes than any other race and income level group combination.

4.0 METHODS

This research is a cross-sectional, quantitative and qualitative study that explores the menstrual experiences and expectations of early adolescent girls.

4.1 SAMPLE

The sample for the current study consisted of 169 newly postmenarcheal adolescent girls from eight Pittsburgh-area neighborhoods (Sto-Rox, Squirrel Hill, Shadyside, Point Breeze, Edgewood, Swissvale, Regent Square, and Wilkinsburg) who were between the ages of 11 and 15 ($M = 13.67$, $SD = 1.02$). The ages at which participants reached menarche were between 9.25 and 15.06 ($M = 12.47$, $SD = 1.01$) while the length of time participants had been postmenarcheal ranged from one month to four years and two months ($M = 1$ year and two months, $SD = 11$ months).

Participants were categorized into four groups: 37 were classified as Caucasians from higher income homes, 46 were classified as Caucasians from lower income homes, 33 were classified as African Americans from higher income homes, and 53 were classified as African Americans from lower income homes. In order to yield appropriate power (80% for a medium effect size with a two-tailed p-value of .05), a minimum of 32 participants was needed in each group.

Race was determined via self-report. Income level was determined by a self-report qualification for free or reduced lunches. That is, participants were asked if they qualify for a free or reduced lunches. Those who did were categorized as coming from a lower income level, while those who did not qualify were identified as coming from a higher income level. To qualify for a free or reduced lunch, federal guidelines stipulate that a family's income must be less than 365 dollars per week for each individual living within the household (Federal Registry, 2007).

4.2 STUDY DESIGN

The present investigation employed a cross-sectional design to determine how newly postmenarcheal adolescents of different racial backgrounds and income levels react to the experience of menarche and menstruation.

4.3 PROCEDURES

The researcher distributed a total of 265 survey packets to girls from one middle school, one high school, and youth group members of two churches within the Pittsburgh area. Of those, 175 useable surveys were returned (i.e., respondents were postmenarcheal and indicated race and whether or not they qualified for a free or reduced lunch), resulting in a 66% response rate. Six respondents were excluded from the sample because the race indicated was not African American or Caucasian (4 were bi- or multi-racial and 2 were Asian American), resulting in a

total of 169 participants (126 girls from the middle and high school and 43 girls from the church youth groups).

Potential participants were given a packet to take home which included (a) two copies of the consent form, (b) one copy of the questionnaire, (c) two self-addressed, stamped envelopes, and, (d) a cover letter with directions and mailing instructions. Copies of the consent form, questionnaire, and cover letter can be found in Appendices A, B, and C, respectively. Parents were instructed to read the consent forms with their daughter and, if they both agree to the youth's participation, sign one copy of the consent form, return it in one of the provided envelopes, and keep one copy for their own records. Girls who had parental permission to participate were instructed to complete the survey and return it in the second provided envelope. It was explained that the purpose of separate envelopes was to protect their privacy. The envelopes were coded so that questionnaire responses could be matched to signed consent forms, thus ensuring that only responses from individuals with parental permission were included in the analyses.

4.4 MEASURES

Participants completed a 4-page questionnaire (Appendix B) which consisted of four sections that solicited (a) demographic information, (b) knowledge about menstruation, (c) preparation for menarche and menstruation, and (d) menstrual attitudes. The entire questionnaire took approximately 15 minutes to complete.

4.4.1 Demographic questionnaire

The demographic questionnaire included six items which asked about participants' background, including their age, race, qualification status for free or reduced lunches, living situation (i.e., the relationship to the people they live with), and menstrual status.

4.4.2 Measure of menstrual knowledge

In order to assess menstrual knowledge, an open-ended question asked participants to explain, in their own words, why girls menstruate. Responses were assigned a point value based on whether they were correct or not (fully correct response = 2, partially correct response = 1, fully incorrect response = 0) with a higher score indicating greater knowledge about menstruation. An example of a fully correct response was "When a girl is healthy she starts to have periods to get her body ready to have a baby. When she doesn't get pregnant each month, the egg that wasn't fertilized has to come out. So does the uterus tissue. That's the blood." An example of a partially correct response was "Because they are not pregnant." An example of an incorrect response was "Because Eve broke the rules." Responses were also content analyzed.

4.4.3 Measure of preparation for menarche

Seven items, developed by the researcher, were used to assess participants' level of preparation for menarche. Using a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree), participants rated their level of agreement with each statement. The

total possible score for this scale ranges from 7 to 35, with a higher score indicating greater feelings of preparedness.

There were two additional questions which dealt with preparation for menarche. The first asked participants to indicate, via a 16-item checklist, which individuals provided them with information about menstruation. Examples of the types of relationships included on the list were “mother,” “cousin,” “teacher,” “doctor/nurse,” and “sister.” The final question invited participants to explain what they wished they knew about menstruation *before* reaching menarche. The preparation for menarche measure had acceptable internal consistency reliability with an alpha coefficient of .72 for this sample.

4.4.4 Adolescent menstrual attitudes questionnaire

The *Adolescent Menstrual Attitude Questionnaire* (AMAQ) (Morse, Kieren, & Bottorff, 1993) is a scale developed to assess menstrual attitudes of both pre- and postmenarcheal adolescents. Unlike other measures of menstrual attitudes, the AMAQ was designed specifically for adolescents and uses terminology that is appropriate for that age group.

There are two versions of the AMAQ, one for premenarcheal girls and one for girls who have experienced menarche, each made up of six subscales. This study utilized a total of 24 items from the following three subscales of the postmenarcheal form: Positive Feelings, Negative Feelings, and Openness Toward Menarche. Using a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree), participants rated their level of agreement with each statement. The total possible score ranges from 24 to 120 with higher scores indicating more positive menstrual attitudes. The AMAQ items used had good internal consistency reliability with an alpha coefficient of .81 for this sample.

4.5 DATA ANALYSIS

Participants were categorized into four groups: (a) Caucasians from higher income homes, (b) Caucasians from lower income homes, (c) African Americans from higher income homes, and (d) African Americans from lower income homes. Each scaled instrument was analyzed via a two-way (Race X Income Level) analysis of variance (ANOVA) with an interaction term in order to examine differences in responses according to racial group and income level. Open-ended responses were analyzed for content and results were used to enrich the statistical analyses.

RQ1—In order to determine the effect of race on knowledge about menstruation, feelings of preparation for menarche, and menstrual attitudes the main effect for race was tested. The raw score of the measure of menstrual knowledge, the total raw score of the measure of preparation for menarche, and the total raw score of the AMAQ served as the dependent variables. The independent variable of race had two levels: Caucasian and African American.

RQ2—In order to determine the effect of income level on knowledge about menstruation, feelings of preparation for menarche, and menstrual attitudes the main effect for income level was tested. The raw score of the measure of menstrual knowledge, the total raw score of the measure of preparation for menarche, and the total raw score of the AMAQ served as the dependent variables. The independent variable of income level had two levels: lower (i.e., qualified for free or reduced lunches) and higher (i.e., did *not* qualify for free or reduced lunches).

RQ3—The interaction effect of race and income level on knowledge about menstruation, feelings of preparation for menarche, and menstrual attitudes was examined. The raw score of the measure of menstrual knowledge, the total raw score of the measure of preparation for

menarche, and the total raw score of the AMAQ served as the dependent variables. The independent variable of race had two levels: Caucasian and African American. The independent variable of income level also had two levels: lower (i.e., qualified for free or reduced lunches) and higher (i.e., did *not* qualify for free or reduced lunches). When a significant interaction was found, an analysis of simple main effects was performed.

5.0 RESULTS

This chapter is divided into four sections. Presented first are the descriptive statistics and ANOVAs for the participants' demographic characteristics. Results of the two-way ANOVAs are then reported for the dependent measures of menstrual knowledge, preparation for menarche, and menstrual attitudes. A critical alpha of .05 was used in all analyses. Participants who qualified for free or reduced lunches will be referred to as lower income and those who did not qualify will be referred to as higher income for ease of presentation.

5.1 DESCRIPTIVE ANALYSES

The 169 girls (86 African American, 83 Caucasian) included in the study were between the ages of 11.51 and 15.48 years old ($M = 13.67$, $SD = 1.02$). They reached menarche between the ages of 9.25 and 15.06 years ($M = 12.48$, $SD = 1.01$) and had been menstruating for at least one month and a maximum of 4.2 years ($M = 13.7$ months, $SD = 11.04$). Participants' current ages were calculated based on their reported date of birth and the date the questionnaire was completed. Age at menarche was calculated based on participants' reported date of birth and their reported length of time menstruating. In order to examine possible differences among race and income levels with respect to the demographic variables since the sample was self-selected, ANOVAs were conducted for each variable.

5.1.1 Analysis for current age

Table 1 presents the mean ages for the four groups of participants. Results of a two-way ANOVA showed that there was a significant interaction between race and income level for participants' current age ($F(1,168) = 4.500, p = .035$). However, as seen in Table 1, three of the four groups were very similar, with only the low income Caucasian participants being older on average. The largest mean difference between the four groups was less than one year of age and was not considered to be of practical significance.

Table 1. Descriptive Statistics for Current Age by Race and Income Level

Race	Income Level	N	Range	Mean	Std. Deviation
African American	Lower	53	11.51-15.48	13.66	1.20
	Higher	33	12.07-14.88	13.36	.92
Caucasian	Lower	46	12.23-15.47	14.21	.93
	Higher	37	12.10-14.47	13.27	.60

The main effects, although significant, were not considered relevant in light of the significant interaction.

5.1.2 Analysis for age at menarche

A two-way ANOVA revealed a significant interaction between race and income level for adolescents' age at menarche ($F(1,168) = 5.375, p = .022$). As can be seen from Table 2, the means for African American participants across income levels was the same, but in the

Caucasian groups, the higher income group reached menarche somewhat earlier than the lower income group, although the difference was only about six months.

Table 2. Descriptive Statistics for Age at Menarche by Race and Income Level

Race	Income Level	N	Range	Mean	Std. Deviation
African American	Lower	53	9.25-13.98	11.92	1.01
	Higher	33	10.47-13.77	11.89	.83
Caucasian	Lower	46	11.93-15.06	13.39	.67
	Higher	37	10.98-14.27	12.73	.62

A significant main effect was found for race ($F(1,168) = 78.982, p = .000$) which indicated that African American participants reached menarche at a significantly earlier age ($M = 11.91, SD = 1.10$) than Caucasian participants ($M = 13.06, SD = 0.71$). This finding is in keeping with other studies that show that African Americans reach menarche at an earlier age than any other racial group in this country (e.g., Chumlea et al., 2002; Herman-Giddens et al., 1997; Malina et al., 1988).

The main effect for income level was also statistically significant ($F(1,168) = 6.315, p = .013$) and showed that full price lunch participants had their first period at an earlier age ($M = 12.33, SD = 0.83$) than participants who qualified for free or reduced lunches ($M = 12.58, SD = 1.12$). Although this finding is counter to other research which suggests that individuals who live in poverty experience stressors that trigger an earlier maturation than those who grow up in more affluent neighborhoods (e.g., Graber, Brooks-Gunn, & Warren, 1995; Moffit et al., 1992; Surbey, 1990), the differences between the means was small and not of practical significance.

5.1.3 Analysis for length of time menstruating

A third two-way ANOVA examined the length of time participants had been menstruating. Descriptive statistics for each of the four groups are presented in Table 3. The interaction between race and income level was not statistically significant ($F(1,168) = 0.003, p = .959$).

Table 3. Descriptive Statistics for Number of Months Menstruating by Race and Income Level

Race	Income Level	N	Range	Mean	Std. Deviation
African American	Lower	53	2.00-50.00	20.43	12.68
	Higher	33	2.00-39.00	16.85	10.48
Caucasian	Lower	46	1.00-29.00	9.67	7.32
	Higher	37	1.00-16.00	6.24	4.23

A significant main effect was present for race ($F(1,168) = 51.503, p = .000$) and indicated that African American participants on average ($M = 19.06, SD = 11.95$) had been menstruating longer than their Caucasian counterparts ($M = 8.14, SD = 6.34$). The main effect for income level was also statistically significant ($F(1,168) = 5.554, p = .020$) and suggested that lower income participants were menstruating longer ($M = 15.43, SD = 11.79$) than higher income participants ($M = 11.24, SD = 9.42$).

5.2 ANALYSES FOR MEASURE OF MENSTRUAL KNOWLEDGE

5.2.1 Quantitative analysis of menstrual knowledge

In order to examine the effects of race and income level on the question of knowledge about menstruation, a two-way ANOVA was performed. Responses to the question of why menstruation occurs were analyzed on a 0 to 2 scale for correctness. Table 4 presents the means by race and income category. It is meaningful that the mean of the highest scoring group, higher income Caucasians, was only in the “partially correct” range, which was indicative of an overall lack of menstrual knowledge by all race and income level groupings.

Table 4. Menstrual Knowledge Mean Scores by Race and Income Level

Race	Income Level	N	Range	Mean	Std. Deviation
African American	Lower	45	0-1	.42	.50
	Higher	26	0-2	.73	.83
Caucasian	Lower	39	0-2	.46	.76
	Higher	35	0-2	1.29	.62

Note. Scores can range from 0 to 2 (0 = incorrect, 1 = partially correct, 2 = fully correct); higher scores indicate more accurate menstrual knowledge.

^a. The total number of individuals in the study is 169. However, not all individuals responded to the question of why girls get periods. As a result, the total *N* reported here only equals 145.

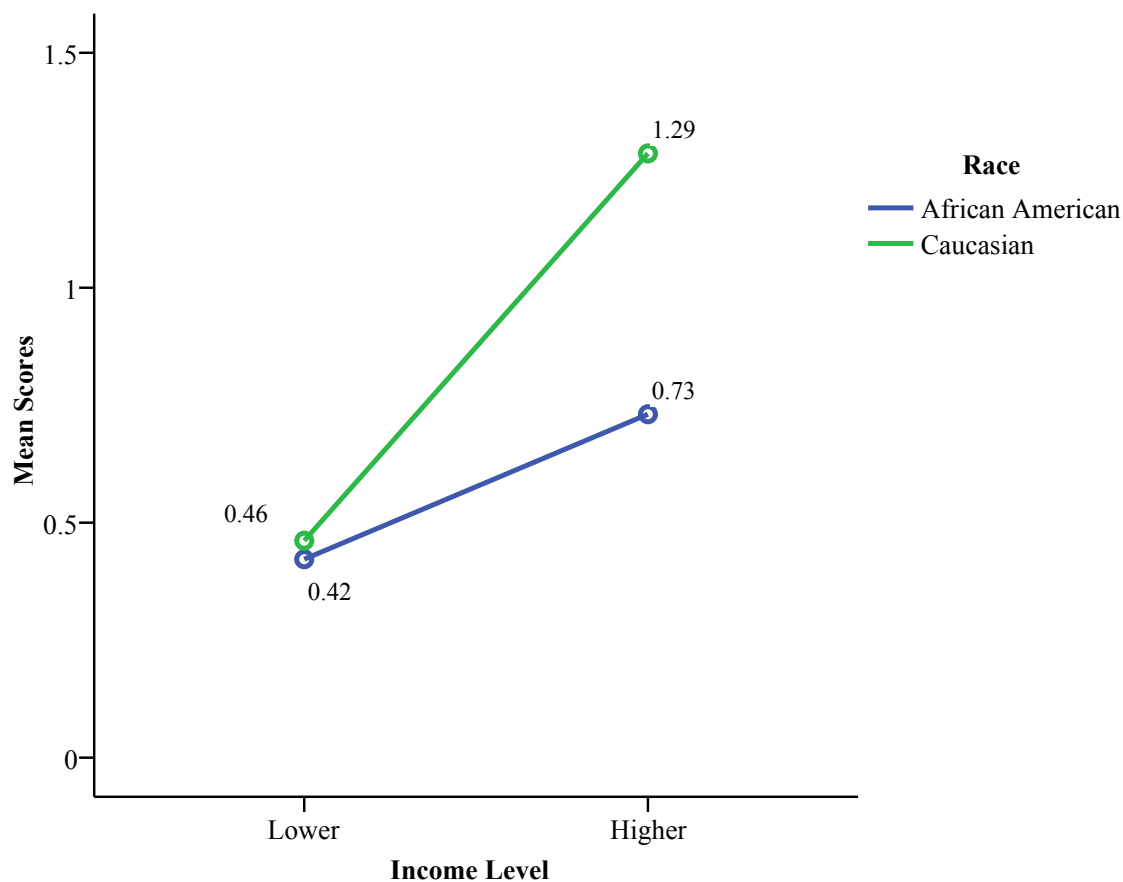
As reported in Table 5, the interaction of race and income level was statistically significant, as were the two main effects.

Table 5. Two-Way ANOVA Summary Table for Menstrual Knowledge

Source	SS	df	MS	F	Sig
Race	3.074	1	3.074	6.887	.010
Income Level	11.167	1	11.167	25.022	.000
Race*Income Level	2.314	1	2.314	5.185	.024
Error	62.928	141	.446		

Figure 1 illustrates the nature of this interaction. The simple effects tests indicated that there was no difference between the African American and Caucasian participants' means at the lower income level, but at the higher income level, the Caucasian mean was significantly higher than that of the African American group. Within the African American groups, there was also no difference across income levels, whereas the income mean difference was significant for Caucasian participants. The higher income Caucasian participants on average were more knowledgeable about menstruation than the other groups.

Figure 1. Interaction of Race and Income Level on Menstrual Knowledge Scores



Because of the nature of this interaction, the main effects of race and income, although significant, were not meaningful. It is obvious that the higher income Caucasians were the one group that on average had responses regarding menstrual knowledge that were more correct. However, even this group mean of 1.29 was closer to the “partially correct” scale value, indicating that irrespective of participants’ race and income level, the adolescents in this study did not have a full understanding of why they menstruate. This is further illustrated in the next section where a content analysis of the actual responses is presented.

5.2.2 Qualitative analysis of menstrual knowledge

Responses to the question of why girls get periods varied greatly, from religiously-based ideas of punishment (e.g., “Girls get periods and cramps because God was mad that Eve made Adam eat the forbidden apple. So we have to pay for their sins.”), to more scientific and technical answers (e.g., “When a girl is healthy she starts to have periods to get her body ready to have a baby. When she's not pregnant the egg that wasn't fertilized has to come out. So does the extra body tissue that makes you look bloated. That's the stuff in the blood that comes out.”). Regardless of the theme of the answers provided or the level of correctness, the majority of responses (64%) were negative in tone and included phrases such as “bad,” “dirty,” and “infected” to describe menstrual blood and tissue. The 145 responses received were organized into categories as listed in Table 6. It is interesting to note that 62 (42.8%) of the adolescents either admitted that they did not know or did not respond at all to this question.

Table 6. Categories of Qualitative Responses to Question of Why Girls Get Periods

Response Categories	H.I.A.A. (N)	H.I.C. (N)	L.I.A.A. (N)	L.I.C. (N)	Overall (N)
Body/Reproductive System Cleansing	5	22	7	11	45
Lack Of Pregnancy	6	19	2	6	33
Natural Process/Maturation	2	1	2	3	8
Prevention Of Illness	0	1	1	0	2
Punishment	0	0	8	2	10
Sign Of Fertility/Reproductive Health	6	22	10	7	45
Don't Know	7	1	20	10	38
Blank/Skipped	7	2	8	7	24
Total	33	68	59	46	205

Note. Although there were only 145 individuals who responded to the question of why girls get periods, some responses fit more than one category. The number of individuals who skipped or left the item blank are also presented. As a result, the total *N* reported is 205.

^a H.I.A.A. indicates higher income African Americans (i.e., African American participants who *did not* qualify for a free or reduced lunch). ^b H.I.C. indicates full-price Caucasians (i.e., Caucasian participants who *did not* qualify for a free or reduced lunch). ^c L.I.A.A. indicates free-reduced African Americans (i.e., African American participants who *did* qualify for a free or reduced lunch). ^d L.I.C. indicates free-reduced Caucasians (i.e., Caucasians participants who *did* qualify for a free or reduced lunch).

When answers were examined by respondents' race and income group, a pattern emerged wherein lower income African American participants tended to rely more on folk wisdom or knowledge (i.e., knowledge based on myths and superstition rather than on scientific evidence) a third of the time to explain why girls get periods. The remaining race and income level groupings used folk knowledge less than a quarter of the time to describe menstruation. Lower income African American participants were also at least twice more likely than any other group to simply state that they did not know why girls menstruate. Additionally, while lower income African American and Caucasian participants were the only two groups to specifically describe menstruation as a form of punishment, all race and income groupings had responses that were negative in tone.

5.3 ANALYSES FOR MEASURE OF PREPARATION FOR MENARCHE

5.3.1 Quantitative analysis of preparation for menarche

The seven items on this scale used a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree. Thus the values could range from 7 to 35 with higher scores indicating greater feelings of preparation for menarche. Table 7 presents the means by race and income category. It is of note that the mean for higher income Caucasian participants was close to the “agree” value of preparation while other race and income level group means fell between the “disagree” and “neutral” value in terms of preparation.

Table 7. Preparation for Menarche Mean Scores by Race and Income Level

Race	Income Level	N	Range	Mean	Std. Deviation
African American	Lower	53	8-35	17.94	7.47
	Higher	33	7-33	20.79	6.88
Caucasian	Lower	46	7-35	18.50	7.70
	Higher	37	14-35	27.14	4.57

Note. Scores can range from 7 to 35 (7 = strongly disagree, 14 = disagree, 21 = neutral, 28 = agree, 35 = strongly agree); higher scores indicate greater feelings of preparation for menarche.

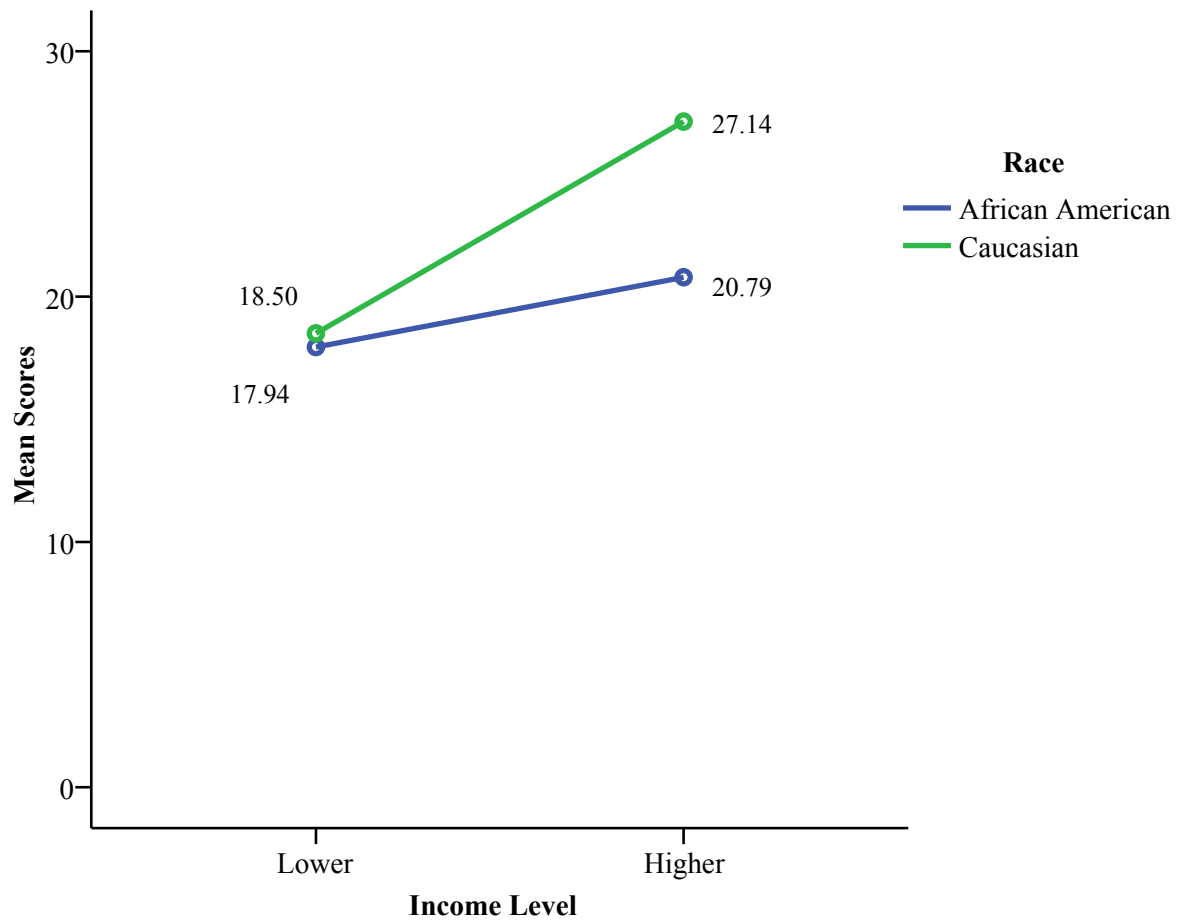
As reported in Table 8, the interaction of race and income level was statistically significant, as were the two main effects.

Table 8. Two-Way ANOVA Summary Table for Preparation for Menarche

Source	SS	df	MS	F	Sig
Race	486.672	1	486.672	10.245	.002
Income Level	1345.574	1	1345.574	28.325	.000
Race*Income Level	342.379	1	342.379	7.207	.008
Error	7838.170	165	47.504		

As illustrated in Figure 2, the interaction was similar to that for menstrual knowledge. Again, the simple effects test indicated that there was no difference between the African American and Caucasian participants' means at the lower income level, but at the higher income level, the Caucasian mean was significantly higher than that of the African American group. Within the African American groups, there was also no difference across income levels, whereas the income mean difference was significant for Caucasian participants. The higher income Caucasian participants on average felt more prepared for menarche than the other groups.

Figure 2. Interaction of Race and Income Level on Preparation for Menarche Scores



Because of the nature of this interaction, the main effects of race and income, although significant, were not meaningful.

5.3.2 Qualitative analysis of preparation for menarche

Responses to the question of who provided information about menstruation revealed that mothers and step-mothers were the most popular sources of menstrual information. Other family members, including fathers, siblings, aunts, and grandmothers, were the second most common source reported. This was followed by healthcare and educational professionals (e.g., doctors, teachers), media and reading materials (e.g., books, websites, magazines, television), and, lastly, friends and peers. The types of individuals who reportedly provided participants with menstrual information are presented in Table 9.

Table 9. Types of Menstrual Information Sources

Source Type	H.I.A.A. (N)	H.I.C. (N)	L.I.A.A. (N)	L.I.C. (N)	Overall (N)
Mother/Step-Mother	24	36	20	46	126
Other Family Members	26	23	49	7	105
Friends/Peers	4	8	3	4	19
Healthcare/Educational Professionals	6	18	2	6	32
Media/Reading Materials	0	6	0	22	28
None	0	0	4	0	4
Blank/Skipped	0	0	3	0	3
Total	60	91	81	85	317

Note. Although there were only 166 individuals who indicated the types of menstrual information sources, many participants reported more than source. The number of individuals who skipped or left the item blank and the number of participants who indicated that they received no information sources are also presented. As a result, the total *N* reported is 317.

^a H.I.A.A. indicates higher income African Americans (i.e., African American participants who *did not* qualify for a free or reduced lunch). ^b H.I.C. indicates higher income Caucasians (i.e., Caucasian participants who *did not* qualify for a free or reduced lunch). ^c L.I.A.A. indicates lower income African Americans (i.e., African American participants who *did* qualify for a free or reduced lunch). ^d L.I.C. indicates lower income Caucasians (i.e., Caucasians participants who *did* qualify for a free or reduced lunch).

When answers were examined by respondents' race and income group, a pattern emerged wherein both lower and higher income Caucasian participants most often reported their mothers or step-mothers as sources of menstrual information (54.1% and 39.6%, respectively), while both lower and higher income African American participants were more likely to receive information from family members other than their mothers (62.8% and 43.3%, respectively). Furthermore, higher income Caucasian respondents were at least three times more likely than any other race and income level grouping to report healthcare and educational professionals as a source of menstrual information. Similarly, lower income Caucasian participants were more than three times more likely than any other race and income level grouping to indicate the media and reading materials (e.g., books, websites, magazines, television) as a source of menstrual information. Additionally, the only individuals who indicated that they had not received any menstrual information prior to menarche were from the lower income African American group.

A second open-ended question asked participants if there was anything they wished they had known before reaching menarche. Out of the 169 participants, only 30 (17.8%) responded to this item. While the reason behind such a small response rate is unclear, it is interesting that such a small number of participants responded to the item when it is considered that the majority of preparation scores fell between the "disagree" and "neutral" value. Also worthy of note is that the group with the most responses to this item, higher income Caucasian participants, is also the highest scoring group on menarcheal preparation and the only group to score close to the "agree" value of preparation. The 30 responses were organized into categories as listed in Table 10. However, due to the fact that less than a fifth of participants responded to the question, these findings should be viewed with caution as they are a subset of the sample.

Table 10. Categories of Qualitative Responses of What Participants Wished They Knew Before Menarche

Response Categories	H.I.A.A. (N)	H.I.C. (N)	L.I.A.A. (N)	L.I.C. (N)	Overall (N)
Cramps Related	0	2	2	0	4
Concealment/Avoid Embarrassment	0	10	0	4	14
Feelings and Expectations	0	3	0	1	4
Normalcy of Menstrual Experience	0	4	0	1	5
Product-Related	2	3	1	0	6
No Previous Knowledge Wanted	0	10	1	0	11
Blank/Skipped	32	13	50	44	139
Total	34	45	54	50	183

Note. Although there were only 30 individuals who responded to the question of what they wished they knew before menarche, some responses fit more than one category. The number of individuals who skipped or left the item blank are also presented. As a result, the total *N* reported is 183.

^a. H.I.A.A. indicates higher income African Americans (i.e., African American participants who *did not* qualify for a free or reduced lunch). ^b. H.I.C. indicates higher income Caucasians (i.e., Caucasian participants who *did not* qualify for a free or reduced lunch). ^c. L.I.A.A. indicates lower income African Americans (i.e., African American participants who *did* qualify for a free or reduced lunch). ^d. L.I.C. indicates lower income Caucasians (i.e., Caucasians participants who *did* qualify for a free or reduced lunch).

Answers ranged from a desire for more practical knowledge (e.g., “How to use tampons” and “How many pads I would need each day”) to more theoretical knowledge (e.g., “I wanted to know what it feels like when the blood is coming out” and “How to know if my period is normal, like the other girls”). Responses also related to concealment and secrecy. For example, many girls indicated a desire to know how to avoid telltale leaks, how to ensure others are not aware of their menstruation, and a yearning to be able to predict exactly when menstruation would begin so that they would “always be ready for it”. One participant went so far as to specifically state that she wanted to know “how to keep it secret.”

When answers were examined by respondents’ race and income group, the data revealed that almost all lower and higher income African American participants left this item blank (94.1% and 92.6%, respectively). Other answers provided by individuals from these two groups focused on a need for more practical information such as how to deal with the painful experience

of menstrual cramps and how to correctly use menstrual products like pads and tampons. Individuals in the higher income Caucasian grouping had more variety in their responses and included desires for both practical (e.g., the most effective menstrual products; number of pads and tampons needed per cycle) and experiential knowledge (e.g., what menstruation actually feels like), as well as information on secrecy and concealment of menstruation and ways to determine when menstruation was going to begin. However, approximately half of the higher income Caucasian participants either left the item blank or simply stated that there was no additional information they wished they had prior to menarche. Lower income Caucasian participants had similar responses with the exception that they did not report a premenarcheal desire for practical information. Additionally, 88% of lower income Caucasian participants failed to respond to the question.

5.4 ANALYSES FOR MEASURE OF MENSTRUAL ATTITUDES

Participants responded to 24 statements regarding their attitudes toward menstruation on a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree. The possible score range was from 24 to 120, with higher scores indicating a more positive attitude. The means in Table 11 ranged from 64.96 to 85.46 and scores showed a great deal of variability between each race and income category. Responding to all statements with a “neutral” answer would yield a score of 72.

Table 11. Menstrual Attitudes Mean Scores by Race and Income Level

Race	Income Level	N	Range	Mean	Std. Deviation
African American	Lower	53	30-111	64.96	24.77
	Higher	33	27-118	77.42	25.34
Caucasian	Lower	46	25-119	73.00	28.35
	Higher	37	25-119	85.46	26.26

Note. Scores can range from 24 to 120 (24 = strongly disagree, 48 = disagree, 72 = neutral, 96 = agree, 120 = strongly agree); higher scores indicate more positive/less negative menstrual attitudes.

As reported in Table 12, the interaction of race and income level and the main effect for race were not statistically significant. However, the main effect for income level revealed a significant difference between groups. Regardless of race, higher income participants reported more positive menstrual attitudes ($M = 81.44$, $SD = 25.96$) than lower income participants ($M = 75.21$, $SD = 27.07$). Both means are closest to the “neutral” verbal label on this attitude scale, although individual attitudes varied greatly within the groups.

Table 12. Two-Way ANOVA Summary Table for Menstrual Attitudes

Source	SS	df	MS	F	Sig
Race	2637.811	1	2637.811	3.836	.052
Income Level	6341.601	1	6341.601	9.222	.003
Race*Income Level	0.0000648	1	0.0000648	.000	1.000
Error	113461.174	165	687.643		

6.0 DISCUSSION

The main goal of this study was to determine if race and income level are associated with early adolescents' reactions to menarche and menstruation in present American culture. Past research on the topic of menarche and menstruation has very nearly focused solely on the experience of middle-class Caucasians (Yeung et al., 2005). Rarely has the influence that race and socioeconomic status have on this stage of adolescent development been taken into consideration (Adler et al., 1993; Evans & Stoddart, 1990; Feinstein, 1993; Keating & Hertzman, 1999). The present investigation attempted to fill that gap by examining the menstrual knowledge, feelings of preparation for menarche, and menstrual attitudes of newly postmenarcheal adolescent girls from various combinations of racial and income level backgrounds to determine if race and income level are associated with reactions to menarche and menstruation. Specifically, it was hypothesized that both African American participants and participants from lower income households would (a) score lower on menstrual knowledge, (b) report feeling less prepared for menarche, and (c) report more negative menstrual attitudes than their counterparts (i.e., Caucasian participants and participants from higher income households). It was further hypothesized that lower income African Americans would (a) score lower on a menstrual knowledge, (b) report feeling less prepared for menarche, and (c) report disproportionately more negative menstrual attitudes than any other race and income level group combination.

The outcomes indicated that (a) overall, participants' lacked accurate menstrual knowledge, (b) overall, participants felt either unprepared or, at best, only somewhat prepared for menarche, (c) overall, participants held ambivalent menstrual attitudes, (d) as a group, the responses of higher income Caucasian participants stood apart from and indicated that they fared better than the other race and income level groupings, and (e) participants appeared to incorporate menstrual taboos into how they approached learning about menstruation and preparing for menarche. Results related to each of the three dependent variables (i.e., menstrual knowledge, preparation for menarche, and menstrual attitudes) are examined further in this section. Also examined are how higher income Caucasian participants were different from the other race and income level groupings in this study, as well as, the qualitative results and how they are associated to menstrual taboos. Limitations and directions for future research are then discussed, followed by conclusions and implications of the study.

6.1 RESULTS RELATED TO THE DEPENDENT MEASURES OF MENSTRUAL KNOWLEDGE, PREPARATION FOR MENARCHE, AND MENSTRUAL ATTITUDES

With regard to menstrual knowledge, the results revealed that three of the four race and income level groupings had mean knowledge scores that indicated a very poor understanding of menstruation. The fourth group, higher income Caucasians, had a mean knowledge score that represented only a partial understanding of menstruation. Consequently, the key finding was that, irrespective of participants' race and income level, the girls in the study did not, as a whole, have a full understanding of why they menstruate. This was not a surprising finding when results of participants' preparation for menarche are taken into account. Like the menstrual knowledge

results, three of the race and income level groupings had mean preparation scores that indicated a lack of readiness for menarche. The fourth group, higher income Caucasians, was the only one to report feeling at least some level of preparedness. Overall, preparation scores indicated that, on average, participants felt unprepared or in doubt about their preparation for menarche. These results are cause for great concern because it suggests that the current efforts in place to educate girls about menstruation are deficient, particularly when it is considered that studies from several decades ago had similar results. For example, in a study of late adolescents' and young women's reproductive knowledge, Johnson, Snow, and Mayhew (1978) found that well over half of their sample did not know why menstruation occurred or the correct time of ovulation. So whether the instruction comes from mothers, other family members, or educational and healthcare professionals, it appears that, in the last thirty years, little progress has been made in the area of menstrual education and, that presently, adequate menstrual information is still not getting across to adolescent girls. This may be evidence of a cycle wherein girls who are not appropriately prepared end up passing misinformation to peers, younger siblings, and in the future, their own daughters. The consequences of this continued ignorance, which include, but are not limited to the development of low self-esteem and early engagement in sexual behaviors, can be dire.

As previous research has identified (e.g., Cumming, Cumming, & Kieren, 1991; Laws, 1990; Rierdan, Koff, & Flaherty, 1986), ignorance in the realm of menstruation and lack of preparation for the event perpetuates myths and misbeliefs. Not understanding menstruation puts girls in a position where they are more susceptible to developing low self-esteem and negative menstrual attitudes. In addition, girls who are unknowledgeable about menstruation are also more likely to engage in sexual behaviors at an earlier age (Padilla & Baird, 1991; Scott-Jones & Turner, 1988), which can result in exposure to sexually transmitted diseases and unwanted

pregnancies. This was further highlighted by results of a study on adolescent knowledge of sexual development (Hockenberry, Richman, Dilorio, Rivero, & Maibach, 1996), where researchers concluded that a lack of menstrual knowledge also accompanied a lack of sexual and birth control knowledge.

Given that the girls in this study lacked menstrual knowledge and preparation and were clearly uneasy about the experience of menarche and menstruation and it would be expected that menstrual attitudes would be largely negative. However, this was not the case. Instead participants' overall menstrual attitudes were neutral. This is contrary to other studies, both domestic and international, which have documented that menstrual knowledge and feelings of preparation for menarche are positively correlated with menstrual attitudes (Brooks-Gunn & Ruble, 1982; Brumberg, 1997; Houppert, 1999; Koff & Rierdan, 1995; McPherson & Korfine, 2004; Moore, 1995; Tang et al., 2003). For example, McPherson and Korfine (2004) maintained that women who reported having had a negative menarcheal experience due in part to a lack of menstrual education also reported far more negative menstrual attitudes in adulthood than those participants who reported a positive experience at menarche. Similarly, a study of sixth graders' social constructions of menarche suggested that girls who had limited menstrual knowledge held more negative menstrual attitudes than their counterparts (Moore, 1995). In a study of Chinese adolescent girls emotional responses to menarche, Tang and colleagues (2003) concluded that negative menstrual attitudes were positively correlated with perceptions of menstruation as a negative event and feelings of inadequate preparation for menarche.

There are two reasons why the results in the present study were not aligned with those of previous studies. Firstly, many of the participants may not have been aware that the menstrual knowledge they rely on is flawed. Many turned to myth and superstition to explain menstruation

while others used more scientific resources. However, for the vast majority of participants, neither source appeared to provide a fully accurate understanding of menstruation. Nonetheless, there was no evidence to indicate that participants did not feel confident with the information that they do have, however incorrect that information may be. As a result, there is no reason for a lack of accurate menstrual knowledge to have any noteworthy influence on their menstrual attitudes. Moreover, many participants reported having little access to preparatory materials and a lack of desire to have been further prepared for menarche. This may be an indication of low expectations about preparation. As with the lack of menstrual knowledge, there is then no cause to presume that lack of preparation would substantially impact the menstrual attitudes of participants.

6.2 RESULTS RELATED TO HYPOTHESES

Not all hypotheses were fully supported by the current results. The order in which the hypotheses are reviewed are not in numerical sequence so as to allow for interactions to be discussed before main effects. Hypothesis 3, which claimed that lower income African American participants would score lower on the measure of menstrual knowledge, preparation for menarche, and menstrual attitudes than any other racial and income level grouping was not supported. While lower income African American participants were indeed the lowest scoring group on knowledge and preparation, the simple main effects test revealed that the differences between groups were only statistically significant between higher income Caucasian participants and each of the other race and income level groupings. With regard to menstrual attitudes, lower income African American participants again scored the lowest on the measure. But the differences among the

four groups were not statistically significant. This is peculiar when one considers that (a) results from the measures of menstrual knowledge and feelings of preparation showed a significant interaction among race and income level and (b) it has been documented that menstrual knowledge and feelings of preparation for menarche are positively correlated with menstrual attitudes (Brooks-Gunn & Ruble, 1982; Brumberg, 1997; Houppert, 1999; Koff & Rierdan, 1995).

Hypothesis 1, which postulated that African American participants would score lower on measures of menstrual knowledge, preparation for menarche, and menstrual attitudes, was partially corroborated. Although African American participants did, on average, have lower attitude scores than Caucasian participants, there was no significant difference between the two groups. However, African American participants were significantly less knowledgeable about menstruation and less prepared for menarche than Caucasian participants. Regardless, the nature of the interaction effect, wherein significant differences were found only when higher income Caucasian participants were involved, rendered these findings inconsequential.

Hypothesis 2, which proposed that participants from a lower income level would score lower than participants from a higher income level on measures of menstrual knowledge, preparation for menarche, and menstrual attitudes was fully confirmed. However, as in the results of the first hypothesis, the discoveries regarding knowledge and preparation were deemed not meaningful in light of the interaction effects. Furthermore, while the difference between the income levels in their menstrual attitudes was significant, both means were closest to the “neutral” scoring range. Therefore, caution should be taken when interpreting this finding. Although higher income participants had less negative menstrual attitudes than lower income

participants, the actual average scores on the measures and their ambivalent meaning indicate that the difference among the income groups may not be of major importance.

Taken together, the key information revealed by the findings of this study is that, on average, higher income Caucasians were notably different from the other race and income level groupings. As many other studies have concluded (e.g., Adler et al., 1993; Bradley & Corwyn, 2002; Evans & Stoddart, 1990; Feinstein, 1993; Keating & Hertzman, 1999; National Research Council, 1995), being Caucasian and coming from a higher income level is a protective factor against maladjustment in development and provides better prospects for education, social opportunities, access to quality health care services, and general well-being. Therefore, it is not surprising that higher income Caucasians in the present study fared better than the other race and income level groupings in their reactions to menarche and menstruation.

6.3 RESULTS RELATED TO THE QUALITATIVE DATA

As part of the exploration of participants' menstrual knowledge and preparation for menarche, qualitative data was collected. With regard to the question of why girls menstruate, overall, participants' responses tended to be framed in a negative light, a finding that is not surprising given that history has shown that menstruation has been stigmatized over time and across cultures (Delaney et al., 1988). Notably, however, over one quarter of respondents stated that they did not know why girls menstruate. However, it is unclear as to whether participants in this study truly did not know why girls menstruate or if their lack of answer is evidence of the presence of the menstrual communication taboo (Hewitt, 2000; Kissling, 1996; Williams, 1983), which stipulates that discussions of menstruation should be nonexistent or, at the very least,

covert. This taboo particularly appeared to be the case for lower income African American participants whom were much more likely than their counterparts to indicate no knowledge about the cause of menstruation. This finding echoes results from a recent study wherein 17 low-income African American women of various ages were interviewed about menstrual communications (Cooper & Koch, 2007). While all the women in the Cooper & Koch study expressed a desire for better communication, they described themselves as avoidant about discussing menstrual events throughout their lives, no doubt leading to confusion, negative menstrual attitudes, and inaccurate knowledge about menstruation, menopause, and menstrual-related health.

Apparently, contributing to the extremely low knowledge scores from lower income African American participants was their reliance on folk knowledge to describe why girls menstruate. Much of this folk knowledge was religious in nature, a source that, traditionally, through its seclusion, exclusion, and purification practices of menstruating women, has presented negative messages about menstruation (Delaney et al., 1988; Schuman, 2001; Shuttle & Redgrove, 2005; Smith, 1991; Weideger, 1976). Additionally, while the responses of lower income Caucasian participants were more mixed in terms of folk knowledge and scientific knowledge, their overall answers were still incorrect. Furthermore, lower income African American and lower income Caucasian participants were the only groups whom described the reason for menstruation as a form of punishment against women. Given the cultural history of menstruation, these findings are expected. Even so, they are striking when one takes into account that most of the participants in the study attended the same school and received similar, if not the same, menstrual education in their health classes. While higher income African American participants were the third highest scoring group, as a whole their responses still tended to be

incorrect. Lower income African American, lower income Caucasian, and higher income African American participants apparently continued to rely on less accurate sources of information about menstruation than higher income Caucasian participants whom reported the most correct menstrual knowledge of the four race and income level groupings.

Future research should examine (a) why lower income African American girls with similar access to menstrual education in schools as Caucasian girls and girls from higher income families continue to hold beliefs that emerge from folk wisdom, (b) why both lower income African American and lower income Caucasian girls were more likely to describe menstruation as a form of punishment, and (c) why higher income Caucasian girls were more likely to have correct menstrual knowledge than their counterparts. One possible cause may be that African American and Caucasian girls from lower income families and African American girls from higher income backgrounds may have less appropriate and accurate resources for information about menstruation outside of the school setting. This suggestion is supported by the number of sources of menstrual information reported in this study. Higher income Caucasian girls reported more menstrual education sources than the other groups. They were also significantly more likely to report healthcare and educational professionals as sources utilized to learn about menstruation. Because of the nature of their work, healthcare and educational professionals can be expected to provide more quality menstrual information than perhaps family members, peers, or the media.

Concerning the question of what participants would have liked to have known about menstruation before reaching menarche, the most interesting finding was that the vast majority of these participants either failed to indicate what information they would have liked to have known about menstruation before reaching menarche or they stated that there was nothing they would

have liked to have know prior to menarche. This is an alarming result when it is considered that three of the four race and income level groupings (all but the higher income Caucasian group) admitted feeling unprepared for menarche.

The previously discussed communication taboo (Hewitt, 2000; Kissling, 1996; Williams, 1983) may be an explanation for participants' lack of desire for information prior to menarche. Respondents who claimed no need for premenarcheal menstrual preparation may simply be working to avoid the topic. This would help explain why so many participants reported feeling underprepared for menarche, but unwilling to seek more information. Results imitate outcomes from Cooper and Koch's (2007) menstrual communications study, in which respondents reported steering clear of menstrual discussions in their daily lives. Even so, more studies need to examine the lack of preparation for menstruation of girls' from various race and income levels, particularly the factors that may be preventing them from seeking out information that would help ready them for menarche.

Another interesting finding was that, of those few participants who did respond to the question, it was both lower and higher income Caucasian participants who specifically requested concealment knowledge. With responses relating to wanting to know how to avoid embarrassing situations and keep menstruation secret, these participants appeared to be influenced by the concealment taboo, which stipulates that menstruation is something that should be hidden and kept secret (Laws, 1990). A possible reason for this focus on concealment may be these girls' reliance on the media (i.e., magazines, websites, and television) for information about menstruation, a source that is notorious for its negative messages and for making concealment and secrecy a chief selling point for their products (Brumberg, 1997; Erchull et al., 2002; Havens & Swenson, 1988; Houppert, 1999). For example, *Seventeen*, one of the most popular magazines

read by adolescents, carries a column devoted to readers' stories of humiliating moments. Many of these accounts focus on embarrassing menstruation stories. The magazine has even gone on to publish a book for adolescents with a collection of these stories entitled *Seventeen: Trauma-Rama: Life's Most Embarrassing Moments*. Additionally, *Seventeen* continues to sponsor the concealment taboo by running ads that remind girls that "Surprises are good for birthdays. Not periods!" (March 2008).

Accompanying lower and higher income Caucasian participants' requests for information on concealing menstruation was the desire for information associated with emotional and psychological needs, such as learning how to tell if their menstrual experience is normal and wanting to know what it feels like to menstruate. This is consistent with previous research in which girls have indicated feeling unprepared for menarche, particularly as it related to their emotional and psychological needs (Koff & Rierdan, 1995, 1996; Koff et al., 1982; Lee et al., 1996; McGrory, 1990; McKeever, 1984; Menke, 1983; Moore, 1995). The menstrual education literature sponsored by the feminine hygiene industry, which was no doubt used by some participants of this study, fails to adequately address the emotional and psychological needs of individuals for which the literature is intended (Brumberg, 1997; Erchull et al., 2002; Havens & Svenson, 1988; Houppert, 1999; Whisnant et al., 1975).

Altogether, the findings from this study suggest that, as a whole, girls lack knowledge and preparation for menstruation, but their attitudes do not appear to be negatively affected by their ignorance. Additionally, by themselves race and income level do not seem to play a substantial role in adolescents' understanding of menarche and menstruation. They do, however, seem to interact, with the real differences lying between higher income Caucasians and each of the other three racial and income level groupings.

6.4 LIMITATIONS OF THE CURRENT STUDY

There are several limitations inherent in the current study that must be considered in the interpretation of results. Two major limitations relate to the appropriate generalizability of the results. Firstly, income level was solely determined by adolescents' self-report of whether or not they qualify for a free or reduced lunch. While this measure has been used in previous studies to indicate socioeconomic status, using only this benchmark fails to make distinctions between all the levels of poverty, education, occupational status, and wealth that fall on the continuum of socioeconomic status. Future studies should utilize multiple methods of identifying income level. Doing so would allow for comparisons among those living in extreme poverty, middle-class adolescents, the wealthy, and all other class divisions within. Additionally, the study focused only on African American and Caucasian adolescents. All other races or combination of races (i.e., bi-racial and multi-racial) were excluded from the sample, thus failing to account for those individuals' experiences and viewpoints. Because so many racial groups are present in America, it is vital that these populations be considered in future research. It may be of particular interest to focus on individuals who come from bi- and multi-racial groups. How they respond to menarche and menstruation may reflect the racial group with which they most identify. Broadening the scope of income level and racial groups included in studies of adolescents' reactions to menarche and menstruation will also allow for more generalizability of future findings.

Another obvious limitation is that this study utilized only postmenarcheal participants; therefore, some of the responses provided are of a retrospective nature and are, consequently, suspect to potential problems inherent in recall. This study also relied on self-report measures. While this enhances participants' anonymity and privacy, it also fails to allow for clarification of

items which some participants may have found confusing. Furthermore, this study was not an experimental design. As a result, only associations and not causal inferences regarding the finding can be made.

Finally, the adolescent girls in this study represent a convenience sample, thus it must be considered that the results are affected by volunteer bias. Because this study dealt with minors who required parental permission to participate, the volunteer bias may be further magnified. A girl had to express a desire to participate and she had to have a parent that was supportive of that desire and willing to complete a consent form. So the biases of both the participants and her parent have to be considered. However, it should be noted that this is a difficult population to reach, especially given the sensitive nature of the questions asked within the study. Therefore, the findings should not be disregarded simply because of the limitations inherent in this research.

6.5 SUGGESTIONS FOR FUTURE RESEARCH

There are several directions in which future research should proceed. In addition to broader sampling of racial and economic diversity, it is imperative to determine why girls from certain racial and income level groups are less knowledgeable about menstruation and feel less prepared for menarche. Specifically, why does accurate menstrual knowledge seem to be missing for lower income African Americans and Caucasians and higher income African Americans, especially in the present case, when they are receiving the same in-school education as higher income Caucasian girls? Why do they continue to hold beliefs that emerge from folk wisdom and view menstruation as a form of punishment? What is preventing them from seeking out information that would help prepare them for menarche?

The role that menstrual taboos appear to play in girls' menstrual knowledge and menarcheal preparation should also receive more attention. Why are low-income African American girls so susceptible to the communication taboo and, therefore, so avoidant about the topic of menstruation? Why do certain groups of girls, such as the higher and lower income Caucasians in this study, seem more likely to internalize the concealment taboo? Identifying vulnerabilities that make some girls more predisposed to feeling a need for silence or secrecy may lead to ways of preventing those behaviors in the future and effectively addressing the feeling of shame inherent in present day menstrual taboos.

Future studies should also consider using premenarcheal participants from diverse racial and socioeconomic backgrounds. This would allow for comparisons between girls awaiting their first periods and those who have already experienced it and the specific issues associated with each group. What's more, identifying problems with which premenarcheal girls from various racial groups and social classes struggle provides opportunities to address them before menarche occurs.

From a measurement standpoint, having participants complete both self-report measures and face-to-face interviews could be valuable. While self-report measures completed in private may result in more honest answers there is great potential for participants to skip or ignore certain questions or items. Face-to-face interviews provide the opportunity to ask probing and follow-up questions based on participants' responses, thus providing more detailed answers. Combining those answers with the self-report responses would offer a richer understanding of how adolescents from differing racial and socioeconomic backgrounds experience menarche and menstruation.

6.6 SUMMARY AND CONCLUSIONS

The results of the three dependent measures revealed that, on the whole, participants had a poor understanding of menstruation, were unprepared for menarche, and had ambivalent menstrual attitudes. In particular, higher income Caucasians participants, with significantly better knowledge and preparation scores, stood apart from the other three racial and income level groupings. This is not surprising given that previous researchers (e.g., Adler et al., 1993; Bradley & Corwyn, 2002; Evans & Stoddart, 1990; Feinstein, 1993; Keating & Hertzman, 1999; National Research Council, 1995) have suggested that being Caucasian and from a higher socioeconomic status allows for better general well-being, as well as better education, social opportunities, and access to health care.

Furthermore, participants appeared to incorporate menstrual taboos into how they approached learning about menstruation and preparing for menarche, but not necessarily in their development of menstrual attitudes. It is well established that taboos are a dominant part of the framework in which menstruation is viewed (Britton, 1996; Delaney, et al., 1988; Deutsch, 1944; Houppert, 1999; Laws, 1990; Thompson, 1942; Williams, 1983). Previous studies have shown that young girls internalize these menstrual taboos, which then impact their outlook of menstruation and their menstrual behaviors (Britton, 1996; Hewitt, 2000; Houppert, 1999; Kissling, 1996; Roberts, et al., 2002; Williams, 1983). Findings from this study seem to support that notion, particularly in terms of the communication and concealment taboos.

The communication taboo restricts discussion about menstruation and, in turn, limits what girls can learn and understand about menstruation. Participants' adherence to this taboo may have played a role in the low menstrual knowledge and preparation scores they received. This would also explain why so many participants had a tendency to fail to answer the question

about why girls get periods and to state that there was no additional preparatory information they would have liked before menarche.

The concealment taboo encourages discretion and secrecy around the event of menstruation. It stipulates that no evidence of menstruation should exist. Based on participants' answers regarding the type of information wanted before menarche, both higher and lower income Caucasian participants appeared to be the only group overtly influenced by this taboo. The type of information they wanted centered on how to, as one participant put it, "keep it secret" and how to avoid leaks and other embarrassing menstrual situations.

What effect these taboos had, if any, on participants' menstrual attitudes is unclear. Because, overall, participants reported neutral attitudes, this implies that the lack of knowledge and preparation reported by participants and the strength of the taboos they appear to have internalized did not extend to their menstrual attitudes. For higher income Caucasian participants in particular, having greater menstrual knowledge and preparation for menarche than their counterparts may not have been a protective factor when it came to the menstrual attitudes they had developed.

Taken together, the findings from this study indicate that, as a whole, girls are unknowledgeable and unprepared for menstruation, but their attitudes do not seem to be negatively affected by their ignorance. Additionally, by themselves race and income level do not seem to play a significant role in adolescents' understanding of menarche and menstruation. However, they do seem to interact, with the real differences lying between higher income Caucasians and each of the other three racial and income level groupings.

It is evident that theories' regarding girls understanding of menarche and menstruation need to take various social and cultural factors into account. Daily practices in how professionals

broach the topic of menstruation both with adolescents and their parents should also consider these factors. The results from this study could be useful for health care providers and educators in improving the ways in which information about menstruation is addressed and disseminated. For those who work with various race and income populations, they will be able to tailor the delivery method of information so that it is better received by different racial and income groups. These results would also prove useful in the development of programs targeted to specific racial or income level groups to educate and empower adolescent girls about menstruation and their health.

APPENDIX A

CONSENT FORM

CONSENT TO ACT AS A SUBJECT IN A RESEARCH STUDY

TITLE: Adolescents' Understanding of Menstruation

PRINCIPAL INVESTIGATOR: Lisandra R. White, Graduate Student
WWPH 5940, Pittsburgh, PA 15213; Phone: 412.401.6334
e-mail: lmrst38@pitt.edu

FACULTY MENTOR: Jane E. Pizzolato, Ph.D., Professor of Psychiatry
WWPH 5940, Pittsburgh, PA 15213; Phone: 412.624.6356
e-mail: pizzolat@pitt.edu

The purpose of this study is to investigate the attitudes, feelings, and knowledge girls have about menstruation. Approximately 250 female adolescent girls will be invited to participate in this research study. If you participate, you will complete a survey that asks questions about your understanding of and opinions about menstruation. The survey will take approximately 15-20 minutes to complete.

There is little risk involved in this study. No invasive procedures or medications are included. You will not be required to put your name on the survey; therefore, your responses will be anonymous. The only risk associated with your participation is that you may feel uncomfortable by some of the items in the survey, but you do not have to answer any questions you do not want to. In addition, you may discuss any feelings and concerns with me if you would like.

There is no cost to you for participating in this study, and you will not directly benefit from participating in this study. However, your participation could help us understand the needs of and challenges faced by girls who are adjusting to puberty, which can benefit you indirectly. In the future, this study may help make it easier for other girls to go through puberty.

No data collected for this study will have your name or any other information that identifies you on it. The only record with your name on it will be this consent form. These consent forms will be kept strictly confidential and will be stored in locked files and retained for five years. Your identity will not be revealed in any description or publications of this research. Your individual results will not be shared with your parents or teachers. However, a report may be provided to the school discussing the results. This report will combine all participants' answers and no names will be included. It is possible that authorized representatives from the University of Pittsburgh Research Conduct and Compliance Office (including the University of Pittsburgh IRB) may review your data for the purpose of monitoring the conduct of this study. In very unusual cases, your research records may be released in response to an order from a court of law. Also, if the investigators learn that you or someone with whom you are involved is in serious danger of potential harm, they will need to inform the appropriate agencies, as required by Pennsylvania law.

Your participation in this study is completely voluntary. You may refuse to take part in it, or may stop participating at any time. Your decision will not affect your relationship with your school or the University of Pittsburgh.

If you have questions about this research study, you may contact the investigators listed at the beginning of this consent form. If you have questions about your rights as a research subject, please contact the Human Subjects Protection Advocate at the University of Pittsburgh IRB Office, 1.866.212.2668.

SUBJECT'S CERTIFICATION

- I have read the consent form for this study and any questions I had, including explanation of all terminology, have been answered to my satisfaction. A copy of this consent form has been provided to me.
- I understand that I am encouraged to ask questions about any aspect of this research study during the course of this study, and that those questions will be answered by the researchers listed on the first page of this form.
- I understand that my participation in this study is voluntary and that I am free to refuse to participate or to withdraw my consent and discontinue my participation in this study at any time without affecting my future relationship with this institution.
- I agree to participate in this study.

Subject's Printed Name

Subject's Signature

Date

PARENT'S CERTIFICATION

- I have read the consent form for this study and any questions I had, including explanation of all terminology, have been answered to my satisfaction. A copy of this consent form has been provided to me.
- I understand that I am encouraged to ask questions about any aspect of this research study during the course of this study, and that those questions will be answered by the researchers listed on the first page of this form.
- As the parent, I agree to allow the youth to participate in this study.

Parent's Printed Name

Parent's Signature

Date

CERTIFICATION OF INFORMED CONSENT

I certify that I have explained the nature and purpose of this research study to the above-named individual, and I have discussed the potential benefits and possible risks of study participation. Any questions the individual has about this study have been answered, and we will always be available to address future questions as they arise.

Lisandra Rodriguez White
Printed Name of Person Obtaining Consent

Principal Investigator
Role in Research Study

Signature of Person Obtaining Consent

Date

APPENDIX B

QUESTIONNAIRE

Please help me learn what girls like you already know or want to know about having your period and becoming a woman.

1. **What is your date of birth? (mm/dd/yy)** _____
2. **How long have you had your period?** _____ years and _____ months
3. **What is your racial background?** (circle all that apply)
 - a. African-American or Black
 - b. Caucasian or White (for example, Italian, Irish, German, etc.)
 - c. Asian, Asian American, or Indian (for example, Japanese, Chinese, etc.)
 - d. Hispanic or Latina (for example, Puerto Rican, Cuban, etc.)
 - e. Native American (for example, Cherokee, Apache, etc.)
 - h. Other
4. **What is your home zip code?** _____
5. **Do you qualify for a free lunch or a reduced lunch? If you are not sure about the answer to this question, please ask a parent.**
 - a. No
 - b. Yes
6. **Circle all the people you live with listed in the checklist below.**
 - a. Mother
 - b. Father
 - c. Step-mother
 - d. Step-father
 - e. Brother(s)
 - f. Sister(s)
 - g. Step- or half- brother
 - h. Step- or half-sister
 - i. Aunt
 - j. Uncle
 - k. Cousin
 - l. Grandmother
 - m. Grandfather
 - n. Other people (please list the relationship to you):

7. **Tell me in your own words why girls get periods.**

8. **Circle all the people who gave you information about periods.**

- a. Mother
- b. Father
- c. Step-mother
- d. Step-father
- e. Brother(s)
- f. Sister(s)
- g. Step- or half- brother
- h. Step- or half-sister
- i. Aunt
- j. Uncle
- k. Cousin
- l. Grandmother
- m. Grandfather
- n. Doctor/Nurse
- o. Teacher
- p. Other people:

9. **Is there anything you wish you knew before you got your first period?**

Please read each sentence and tell me how much you agree or disagree with each one. Please circle only one answer for each sentence.

		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
10.	I was given helpful information about periods before I got my first one.					1 2 3 4 5
11.	I felt ready when I got my first period.					1 2 3 4 5
12.	I knew what to do when I got my first period.					1 2 3 4 5
13.	I understood what was happening to my body when I got my first period.					1 2 3 4 5
14.	I had enough stuff (like pad or tampons) when I got my first period.					1 2 3 4 5

	1	2	3	4	5
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
15.	I knew how to use pad or tampons when I got my first period.				1 2 3 4 5
16.	I knew what to expect before I got my first period.				1 2 3 4 5
17.	When I am having my period, I am scared that the boys will find out.				1 2 3 4 5
18.	I have not told anyone that my periods have started.				1 2 3 4 5
19.	I was happy when I found out about menstruation.				1 2 3 4 5
20.	I am bothered by buying tampons or pads at school or at a store.				1 2 3 4 5
21.	Just the fact that I have my period makes me uncomfortable.				1 2 3 4 5
22.	I was scared stiff when my first period started.				1 2 3 4 5
23.	I worry a lot about my periods starting unexpectedly.				1 2 3 4 5
24.	I do not like to be seen putting pads in the garbage.				1 2 3 4 5
25.	When I talk with my friends about periods, I feel uncomfortable about it.				1 2 3 4 5
26.	I worry a lot that blood will leak through my clothes.				1 2 3 4 5
27.	I couldn't wait to get my first period.				1 2 3 4 5
28.	I like to talk about periods with my friends.				1 2 3 4 5
29.	I am embarrassed to ask questions about periods.				1 2 3 4 5
30.	I feel excited when I get my period.				1 2 3 4 5
31.	I feel very grown up when I have my period.				1 2 3 4 5
32.	I am terrified that people will find out when I have my period.				1 2 3 4 5

	1	2	3	4	5
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
33.	I feel uncomfortable studying about menstruation at school.				1 2 3 4 5
34.	I feel it's OK to discuss periods with boys.				1 2 3 4 5
35.	Every time someone mentions "period", I get nervous.				1 2 3 4 5
36.	I am glad I have grown mature enough to menstruate.				1 2 3 4 5
37.	I feel special when I have my period.				1 2 3 4 5
38.	I feel proud when I have my period.				1 2 3 4 5
39.	When I began having my period, I changed into a woman.				1 2 3 4 5
40.	I feel ugly and gross when I have my period.				1 2 3 4 5

Thank you for participating in this study!

APPENDIX C

COVER LETTER

May 30, 2008

Dear Parent,

I am writing to you because you have a daughter who may be interested in participating in a research study I am conducting. I am a graduate student at the University of Pittsburgh and would like to ask you to consider allowing your daughter to participate in this study. Your daughter's participation in the study will involve her completing a brief survey about her experiences with menstruation. Attached is a consent form for your daughter to participate. This study has received approval from the University of Pittsburgh's Institutional Review Board.

Please carefully read the consent form with your daughter. If you agree to allow her to participate in the study, please sign your name under the section titled "Parent's Certification" and initial the bottom of each page where indicated. Your daughter will also need to sign under the section titled "Subject's Certification". Return the signed consent form in one of the provided self-addressed, stamped envelope. After your daughter has completed the survey, return it in the second self-addressed, stamped envelope. She does not need to put her name on the survey. The purpose of having two separate envelopes is to protect you and your daughter's privacy.

Please return the signed consent form and the completed survey by June 15, 2008. Should you have any questions or concerns please don't hesitate to contact me at 412.401.6334 or lmrst38@pitt.edu.

Sincerely,

Lisandra Rodriguez White
Doctoral Candidate, Psychology in Education
University of Pittsburgh

REFERENCES

- Abraham, S., Fraser, L., Gebiski, V., Knight, C. Llewellyn-Jones, D., Mira, M., & McNeil, D. (1985). Menstruation, menstrual protection, and menstrual cycle problems. *The Medical Journal of Australia*, 142, 247-251.
- Adler, N. E., Boyce, W. T., Chesney, M. A., Folkman, S., and Syme, S. L. (1993). Socioeconomic inequalities in health: No easy solution. *Journal of the American Medical Association*, 269, 3140-3145.
- Belsky, J., Steinberg L., & Draper, P. (1991). Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development*, 62, 647-670.
- Benedict, R. (1944). *Patterns of culture*. Boston: Houghton Mifflin.
- Benjet, C., & Hernandez-Guzman, L. (2002). A short-term longitudinal study of pubertal change, gender, and psychological well-being of Mexican early adolescents. *Journal of Youth and Adolescence*, 31, 429-442.
- Blum, R. W., Beuhring, T., Shew, M. L., Bearinger, L. H., Sieving, R. E., & Resnick, M. D. (2000). The effects of race/ethnicity, income, family structure on adolescent risk behaviors. *American Journal of Public Health*, 90, 1879-1884.
- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, 53, 371-399.
- Britton, C. J. (1996). Learning about 'the curse': An anthropological perspective on experiences of menstruation. *Women's Studies International Forum*, 19, 645-653.
- Brooks-Gunn, J. (1992). Growing up female: Stressful events and the transition to adolescence. In T. M. Field, P. McCabe, & N. Schneiderman (Eds.), *Stress and coping in infancy and childhood* (pp. 119-145). Hillsdale, NJ: Erlbaum.
- Brooks-Gunn, J., & Petersen, A. (Eds.). (2004). *Girls at puberty: Biological and psychosocial perspectives*. (2nd ed.). New York: Springer.

- Brooks-Gunn, J., Petersen, A., & Eichorn, D. (1985). The study of maturation timing effects in adolescence. *Journal of Youth and Adolescence*, 14, 149-161.
- Brooks-Gunn, J., & Ruble, D. N. (1982). The development of menstrual related beliefs and behaviors during early adolescence. *Child Development*, 53, 1567-1577.
- Brumberg, J. J. (1997). *The body project: An intimate history of American girls*. Random House: New York.
- Buchanan, M. C., Villagran, M. M., & Ragan, S. L. (2001). Women, menopause, and (ms.)information: Communication about the climacteric. *Health Communication*, 14 (1), 99-119.
- Chrisler, J. C., & Zittel, C. B. (1998). Menarche stories: Reminiscences of college students from Lithuania, Malaysia, Sudan, and the United States. *Health Care for Women International*, 19, 303-312.
- Chumela, W. C., Schubert, C. M., Roche, A. F., Kulin, H. E., Lee, P. A., Himes, J. H., et al. (2003). Age at menarche and racial comparisons in U.S. girls. *Pediatrics*, 111, 110-113.
- Cooper, S. C., & Koch, P. B. (2007). "Nobody told me nothing": Communication about menstruation among low-income African-American women. *Women and Health*, 46, 57-78.
- Costos, D., Ackerman, R., & Paradis, L. (2002). Recollections of menarche: Communication between mothers and daughters regarding menstruation. *Sex Roles*, 46, 49-59.
- Cumming, D., Cumming, C., Kieren, D. (1991). Menstrual mythology and sources of information about menstruation. *Educational Psychology and Family Studies*, 164, 472-476.
- Danza, R. (1983). Menarche: Its effects on mother-daughter and father-daughter interactions. In S. Golub (Ed.), *Menarche: The transition from girl to woman* (pp. 99-106). Lexington, MA: Lexington Books.
- Delaney, J., Lupton, M. J., & Toth, E. (1988). *The curse: A cultural history of menstruation* (2nd ed.). Chicago: University of Illinois Press.
- De Troyer, K., Herbert, J. A., Johnson, J. A., & Korte, A. (Eds.). (2003). *Wholly woman, holy blood: A feminist critique of purity and impurity*. New York: Continuum International Publishing Group.
- Deutsch, H. (1944). *The psychology of women: A psychoanalytic interpretation*. New York: Grune & Stratton.

- Erchull, M. J., Chrisler, J. C., Gorman, J. A., & Johnston-Robledo, I. (2002). Education and advertising: A content analysis of commercially produced booklets about menstruation. *Journal of Early Adolescence*, 22, 455-474.
- Evans, R.G., & Stoddart, G. (1990). Producing health: Consuming health care. *Social Science and Medicine*, 31, 1347-1363.
- Farran, D. C., & Margolis, L. H. (1987). The family economic environment as a context for children's development. *New Directions for Child Development*, 35, 69-87.
- Federal Register (2007). *Income Eligibility Guidelines*, 72 (38), 8685-8688.
- Feinstein, J.S. (1993). The relationship between socioeconomic status and health: A review of the literature. *Milbank Quarterly*, 71, 279-322.
- Frazer, J. G. (1951). The golden bough. In J. Delaney, M. J. Lupton, & E. Toth. *The curse: A cultural history of menstruation* (2nd ed.), (pp. 7-17). Chicago: University of Illinois Press.
- Ge, X., Conger, R. D., & Elder, G. H. (1996). Coming of age too early: Pubertal influences on girls' vulnerability to psychological distress. *Child Development*, 67, 3386-3400.
- Geronimus, A. T. (1996). Black/White differences in the relationship of maternal age to birth weight: A population-based test of the weathering hypothesis. *Social Science and Medicine*, 42, 589-597.
- Gillock, K. L., & Reyes, O. (1999). Stress, support, and academic performance of urban, low-income, Mexican-American adolescents. *Journal of Youth and Adolescence*, 28, 259-282.
- Gillooly, J. (1998). *Before she gets her period: Talking with your daughter about menstruation*. Los Angeles: Perspective Publishing.
- Golub, S. (1992). *Periods: From menarche to menopause*. Newbury Park: Sage Publications.
- Graber, J. A., Brooks-Gunn, J., & Warren, M. P. (1995). The antecedents of menarcheal age: Heredity, family environment, and stressful life events. *Child Development*, 66, 346-359.
- Havens, B., & Svenson, I. (1988). Imagery associated with menstruation in advertising targeted to adolescent women. *Adolescence*, 23, 89-97.
- Herman-Giddens, M. E., Slora, E. J., Wasserman, R. C., Bourdony, C. J., Bhapkar, M. V., Koch, G. G., et al. (1997). Secondary sexual characteristics and menses in young girls seen in office practice: A study from the Pediatric Research in Office Settings Network. *Pediatrics*, 99, 505-512.

- Hewitt, J. P. (2000). *Self and society: A symbolic interactionist social psychology* (8th ed.). Needham Heights, MA: Allyn and Bacon.
- Houppert, K. (1999). *The curse: Confronting the last unmentionable taboo: Menstruation*. New York: Farrar, Straus, & Giroux.
- Hockenberry-Eaton, M., Richman, M. J., Dilorio, C., Rivero, T., Maibach, E. (1996). Mother and adolescent knowledge of sexual development: The effects of age, gender, and sexual experience. *Adolescence*, 31, 35-47.
- Janes, B. A., & Morse, J. M. (1990). Adolescent girls' perceptions of and preparation for menarche. *The Canadian Journal of Nursing Research*, 22, 47-59.
- Jargowsky, P. A., & Bane, M. (1990). Ghetto poverty: Basic questions. In L. E. Lynn, Jr., & M. G. H. McGeary (Eds.), *Inner-city poverty in the United States* (pp. 16-67). Washington, DC: National Academy Press.
- Jencks, C., & Mayer, S. E. (1990). Residential segregation, job proximity and Black job opportunities. In L. E. Lynn, Jr., & M.G.H. McGeary (Eds.), *Inner-city poverty in the United States* (pp.187-222). Washington, DC: National Academy Press.
- Johnson, S. M., Snow, L. F., & Mayhew, H. E. (1978). Limited patient knowledge as a reproductive risk factor. *Journal of Family Planning*, 6, 855-862.
- Keating, D.P., & Hertzman, C. (Eds.). (1999). *Developmental health and the wealth of nations: Social, biological and educational dynamics*. New York: Guilford Press.
- Kim, K., & Smith, P. K. (1998). Retrospective survey of parental marital relations and child reproductive development. *International Journal of Behavioral Development*, 22, 729-751.
- Kissling, E. A. (1996). 'That's just a basic teen-age rule': Girls' linguistic strategies for managing the menstrual communication taboo. *Journal of Applied Communication Research*, 24, 292-309.
- Koff, E., & Rierdan, J. (1995). Early adolescent girls' understanding of menstruation. *Women and Health*, 22, 1-19.
- Koff, E., & Rierdan, J. (1996). Pre-menarcheal expectations and post-menarcheal experiences of positive and negative menstrual related changes. *Journal of Adolescent Health*, 18, 286-291.
- Koff, E., Rierdan, J., & and Jacobson, S. (1981). The personal and interpersonal significance of menarche. *The Journal of the American Academy of Child Psychiatry*, 20, 148-158.

- Koff, E., Rierdan, J., & Sheingold, K. (1982). Memories of menarche: Age, preparation, and prior knowledge as determinants of initial menstrual experience. *Journal of Youth and Adolescence*, 11, 1-9.
- Koff, E., Rierdan, J., & Stubbs, M. L. (1990). Conceptions and misconceptions of the menstrual cycle. *Women and Health*, 16, 119-135.
- Laws, S. (1990). *Issues of Blood: The Politics of Menstruation*. London: Macmillan.
- Lee, A. (2001). Premenstrual distress: Its measurement and relationship with psychosocial variables among Chinese women in Hong Kong. *Dissertation Abstract International*, 61, 4413.
- Lee, J., & Sasser-Coen, J. (1996). Memories of menarche: Older women remember their first period. *Journal of Aging Studies*, 10, 83-101.
- Lindahl, C., McNamara, J., & Lindow, J. (Eds.). (2002). *Medieval folklore: A guide to myths, legends, tales, beliefs, and customs*. Oxford: Oxford University Press.
- Livson, N., & Peskin, H. (1980). Perspectives on adolescence from longitudinal research. In J. Adelson (Ed.), *Handbook of adolescent psychology* (pp. 47-98). New York: Wiley.
- Ludwig, J., Ladd, H. F., & Duncan, G. J. (2001). The effects of urban poverty on educational outcomes: Evidence from a randomized experiment. In W. G. Gale & J. Pack (Eds.), *Brookings-Wharton Papers on Urban Affairs, Vol. 2* (pp. 147-201). Washington DC: Brookings Institution Press.
- Ludwig, J., Duncan, G. J., & Hirschfield, P. (2001). The effects of urban poverty on juvenile crime: Evidence from a randomized housing-mobility experiment. *Quarterly Journal of Economics*, 116, 665-679.
- Malina, R. M., Bouchard, C., & Beunen, G. (1988). Human growth: Selected aspects of current research on well-nourished children. *Annual Review of Anthropology*, 17, 187-219.
- Marvan, M. L., Morales, C., & Cortes-Iniestra, S. (2006). Emotional reactions to menarche among Mexican women of different generations. *Sex Roles*, 54, 323-330.
- Marvan, M. L., Vacio, A., & Espinosa-Hernandez, G. (2001). A comparison of menstrual changes expect by pre-menarcheal and post-menarcheal adolescents in Mexico. *Journal of School Health*, 71, 458-461.
- McGrory, A. (1990). Menarche: Responses of early adolescent females. *Adolescence*, 25, 265-270.
- McKeever, P. (1984). The perpetuation of menstrual shame: Implications and directions. *Women and Health*, 9, 33-45.

- McPherson, M. E., & Korfine, L. (2004). Menstruation across time: Menarche, menstrual attitudes, experiences, and behaviors. *Women's Health Issues, 14*, 193-200.
- Meggitt, M. J. (1964). Male-female relationships in the Highlands of Australian New Guinea. *American Anthropologist, 66*, 204-224.
- Menke, E. M. (1983). Menstrual beliefs and experiences of mother-daughter dyads. In S. Golub (Ed.), *Menarche: The transition from girl to woman* (pp.133-137). Lexington, MA: Lexington Books.
- Moffit, T. E., Caspi, A., Belsky, J., & Silva, P. A. (1992). Childhood experience and the onset of menarche: A test of a sociobiological model. *Child Development, 63*, 47-58.
- Moore, S. M. (1995). Girls' understanding and social constructions of menarche. *Journal of Adolescent Health, 18*, 87-104.
- Morse, J. M., Kieren, D., & Bottorff, J. (1993). The adolescent menstrual attitude questionnaire, part I: Scale construction. *Health Care for Women International, 14*, 39-62.
- National Research Council (1995). *Losing Generations: Adolescents in High-Risk Settings*. Washington, D.C.: National Academy Press.
- Novak, E. (1916). The superstition and folklore of menstruation. *John Hopkins Hospital Bulletin, 27*, 86-95.
- Padilla, A. M., & Baird, T. L. (1991). Mexican-American adolescent sexuality and sexual knowledge: An exploratory study. *Hispanic Journal of Behavioral Sciences, 13*, 95-104.
- Paige, K. E. (1973). Women learn to sing the menstrual blues. *Psychology Today, 7*(4), 41-46.
- Petersen, A. C. (1983). Menarche: Meaning of measures and measuring meaning. In S. Golub (Ed.), *Menarche: The transition from girl to woman* (pp.63-76). Lexington, MA: Lexington Books.
- Pipher, M. (1994). *Reviving Ophelia: Saving the selves of adolescent girls*. New York: Ballantine Books.
- Pliny, C. (1989). *Natural history: Books 3-7* (H. Rackham, Trans.). Cambridge: Harvard University Press. (Original work published 77 AD).
- Pogrebin, L. (1991). *Deborah, Golda, and me: Being female and Jewish in America*. New York: Crown.
- Rambam, Hilchot *Issurei Biah*, 11:16.

- Rempel, J. K., & Baumgartner, B. (2003). The relationship between attitudes toward menstruation and sexual attitudes, desires, and behavior in women. *Archives of Sexual Behavior*, 32, 155-163.
- Richardson, J. L., Radziszewska, B., Dent, C. W., & Flay, B. R. (1993). Relationship between after-school care of adolescents and substance use, risk taking, depressed mood, and academic achievement. *Pediatrics*, 92, 32-38.
- Rierdan, J., Koff, E., & Flaherty, J. (1983). Guidelines for preparing girls for menstruation. *Journal of the American Academy of Child Psychiatry*, 22, 480-486.
- Rierdan, J., Koff, E., & Flaherty, J. (1986). Conceptions and misconceptions of menstruation. *Women and Health*, 10, 33-45.
- Robert-McComb, J. J., Norman, R. L., & Zumwalt, M. (2007). *The active female: Health issues throughout the lifespan*. Totowa, NJ: Humana Press.
- Roberts, T. A., Goldenberg, J. L., Power, C., & Pyszczynski, T. (2002). "Feminine protection": The effect of menstruation on attitudes toward women. *Psychology of Women Quarterly*, 26, 131-139.
- Ruble, D. N., & Brooks-Gunn, J. (1982). The experience of menarche. *Child Development*, 53, 1557-1566.
- Schuman, M. (2001). *Mayan and Aztec mythology*. Berkeley Heights, N.J.: Enslow Publishers.
- Scott-Jones, D. & Turner, S. L. (1988). Sex education, contraceptive and reproductive knowledge, and contraceptive use among black adolescent females. *Journal of Adolescent Research*, 3, 171-187.
- Seventeen*. (2008, March).
- Shuttle, P., & Redgrove, P. (2005). *The wise wound: Menstruation and every woman*. New York: Marion Boyars Publishers.
- Silbereisen, R. K., Walper, S., & Albrecht, H. T. (1990). Family income loss and economic hardship: Antecedents of adolescents' problem behavior. *New Directions for Child Development*, 46, 27-47.
- Simmons, R. G., & Blyth, D. A. (1987). *Moving into adolescence: The impact of pubertal change and school context*. New York: Aldine DeGruyter.
- Simmons, R. G., Blythe, D. A., & McKinney, K. (1983). The social and psychological effects of puberty on white females. In J. Brooks-Gunn & A. Petersen (Eds.), *Girls at puberty* (pp. 111-140). New York: Putnam.

- Skandhan, K. P., Pandya, A. K., Skandhan, S., & Mehta, Y. B. (1988). Menarche: Prior knowledge and experience. *Adolescence*, 23, 149-154.
- Smith, H. (1991). *The world's religions: Our great wisdom traditions*. New York: Harper Collins.
- Stattin, H., & Magnusson, D. (1990). *Pubertal maturation in female development*. Hillsdale, N.J.: Erlbaum.
- Steinberg, L. (1988). Reciprocal relation between parent-child distance and pubertal maturation. *Developmental Psychology*, 24, 122-128.
- Stoltzman, S. M. (1986). Menstrual attitudes, beliefs, and symptom experiences of adolescent females, their peers, and their mothers. *Health Care for Women International*, 7, 97-114.
- Stubbs, M. L., Rierdan, J., & Koff, E. (1989). Developmental differences in menstrual attitudes. *Journal of Early Adolescence*, 9, 480-498.
- Surbey, M. K. (1990). Family composition, stress, and the timing of human menarche. In T. E. Ziegler & F. B. Bercovitch (Eds.). *Socioendocrinology of Primate Reproduction* (pp. 11-32). New York: Wiley.
- Surbey, M. K. (1998). Parent and offspring strategies in the transition at adolescence. *Human Nature*, 9, 67-94.
- Tang, C. S. K., Yeung, D. Y. L., & Lee, A. M. (2004). Psychosocial correlates of emotional responses to menarche among Chinese adolescent girls. *Journal of Adolescent Health*, 33, 193-201.
- The Tampax report*. (1981). New York: Ruder, Finn, & Rotman.
- Thompson, C. (1942). Cultural pressures in the psychology of women. *Psychiatry*, 5, 331-339.
- Tiger, L. (1970). Male dominance? Yes, alas. A sexist plot? No. In S. Golub, *Periods: From menarche to menopause* (p. 85). Newbury Park: Sage Publications.
- Walker, B. (1983). Menstrual blood. In B. Walker (Ed.), *The woman's encyclopedia of myths and secrets* (pp. 635-645). San Francisco: Harper Collins.
- Walsh, M. R. (1979). The quirks of a woman's brain. In R. Hubbard, M. S. Henifin, & B. Fried (Eds.), *Women looking at biology looking at women* (pp. 103-125). Cambridge: Schenkman Publishing Co.
- Wasserfall, R. (Ed.). (1999). *Women and water: Menstruation in Jewish life and law*. Hanover, N.H.: Brandeis University Press.

- Webster, H. (1942). *Taboo: A sociological study*. Stanford: Stanford University Press.
- Weideger, P. (1976). *Menstruation and menopause: The physiology and psychology, the myth and the reality*. New York: Knopf.
- Whisnant, L., Brett, E., & Zegans, L. (1975). Implicit messages concerning menstruation in commercial educational materials prepared for young adolescent girls. *American Journal of Psychiatry*, 132, 815-820.
- Whisnant, L., & Zegans, L. (1975). A study of attitudes toward menarche in white middle-class American adolescent girls. *American Journal of Psychiatry*, 132, 809-814.
- Williams, L. R. (1983). Beliefs and attitudes of young girls regarding menstruation. In S. Golub (Ed.), *Menarche: The transition from girl to woman* (pp.139-147). Lexington, MA: Lexington Books.
- Winter, M. (1997) Teenage girls in jeopardy. *Human Ecology Forum*, 35(3), 12-16.
- Woods, N. F., Dery, G. K., & Most, A. (1982). Recollections of menarche, current menstrual attitudes, and perimenstrual symptoms. *Psychosomatic Medicine*, 44, 285-293.
- Yeung, D. Y. L., Tang, C. S. K., & Lee, A. M. (2005). Psychosocial and cultural factors influencing expectations of menarche: A study on Chinese premenarcheal teenage girls. *Journal of Adolescent Research*, 20, 118-135.